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CHOLERA  
DYSENTERY AND FEVER  
THEIR NATURE  
CAUSES AND TREATMENT

47. 1619.

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CHOLERA,  
DYSENTERY, AND FEVER,  
PATHOLOGICALLY AND PRACTICALLY  
CONSIDERED;

OR THE

NATURE, CAUSES, CONNEXION, AND TREATMENT  
OF THESE DISEASES,  
IN ALL THEIR FORMS.

BY

CHARLES SEARLE, M.D. : M.R.C.S.E.

LATE OF THE E. I. COMP. MADRAS ESTABLISHMENT ;  
AND, DURING THE EPIDEMIC PREVALENCE OF THE DISEASE IN EUROPE, PHYSICIAN  
IN CHIEF TO THE PRINCIPAL CHOLERA HOSPITAL OF WARSAW.

---

" The Laws of Nature being immutable, disease should never be considered as an "ignis fatuus," not to be understood, but as a reality, always to be explained."—MEDICUS.

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LONDON :  
JOHN CHURCHILL, PRINCES STREET, SOHO.

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1847.

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7, Kingsmead-street.**

## DEDICATION.

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*To the Medical Officers of the Indian Army.*

GENTLEMEN,

Having for so many years been a member of your body, and entertaining feelings of pride and interest in the service, I can claim no higher honour than that of dedicating this work to you, for whom so wide a field is open for carrying into practical effect whatever may be considered advisable in its pages.

The Court of Directors of the East India Company, with their usually enlightened concern for the millions under their paternal dominion, and regard for the welfare of the many in their employ, have enabled me—with a liberality demanding this public acknowledgment—to present to each of you a copy of this publication, which has for its chief object, the dissemination of IMPROVED PRINCIPLES of treating that scourge of India, and it has been said—“*opprobrium medicorum*”—the Cholera.



As this work has very properly been submitted by the Directors to the ordeal of a competent medical tribunal, to justify them in their patronage of it, I trust it will be found not undeserving your attention ; and as such, Gentlemen, you will do me the honour to accept it, in the spirit of the author, addressing himself to a body of liberal and enlightened men, with no other object in view than that of adding his mite towards the advancement of medical science, and the relief of suffering humanity; the subject having recently been most painfully forced upon his re-consideration, by the untimely death of a beloved child—a victim to the disease.

Earnestly recommending the subject to your serious attention, as well as the views advanced relative to Fever and Dysentery—which, as associated in character with Cholera, I have been induced to embody in this work, allow me,

Gentlemen,

to subscribe myself,

with unalterable regards,

Your's, most faithfully,

*Bath, July, 1847.*

*C. SEARLE.*

## PREFACE.

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THE subjects of this work—Cholera, Fever, and Dysentery—are of the greatest importance,—a clear comprehension of them embracing, indeed, the principles of the right treatment of most diseases.

On the Cholera I published a work some years ago, but numerous considerations conspire, at the present time, to render any apology unnecessary for my again inviting the attention of the profession, and the public both in Europe and in India, to a further consideration of the subject, and to views of its character and treatment resulting from lengthened experience, matured and confirmed by subsequent observation and reflection, which it is the object of this work to propound.

Among the reasons influencing me for again drawing attention to the subject, may be mentioned the facts—of the disease having prevailed with unusual fatality in our eastern empire during the past year, and of the profession being as much baffled as ever in its treatment,—and that also the disease is extending in the direction it took on the occasion of its visiting Europe as an epidemic in 1830; and to these facts may be added another—that, if the causes assigned in the following pages be the true causes of the disease, as it exists in its more ordinary forms, the disease being essentially the same in all its varieties and in all countries, it must continue to prevail, as it does now in India, at certain seasons in Great Britain (and which, too, it often did in a severe form in Sydenham's days), as long as the same laws, which now govern Nature's operations, continue to exist; diarrhoea and dysentery being varieties also of the same affection. And that the causes assigned for the disease as it ordinarily

occurs are the true ones, was strikingly exemplified by the character of the disease which so generally prevailed throughout the United Kingdom during the summer of last year ; and the same is attested by the disease, in its epidemic and severest form, being known in India (where these causes are in more active operation), from our earliest intercourse with that country ; and by the fact, also, of the disease being well described by Dr. Jackson, in his work on Fever, as occurring in the West Indies, long before the modern outbreak of the disease as an epidemic in India, in the camp of the late Marquis of Hastings, was recorded in 1817. It is not, therefore, a subject of ephemeral existence, but a disease which will continue to prevail in some of its forms, and occasionally with desolating effects, there is too much reason to fear, to the end of time,—and as such, is deserving our best consideration.

In this work I address myself to the public no less than to the profession, seeing how great the number of persons there is in India at all times, both civil and military, at out-posts, and others travelling, beyond the range of professional assistance, to whom some knowledge of the disease would seem indispensable ; indeed, within the last few months, I have to deplore the loss of a friend, in the person of Capt. R—, of the 44th regt. M. N. I., who thus on a march was seized with cholera, and died in the absence of professional aid ; and this is an every day occurrence. In short, every European in India should at least be made acquainted with its symptoms, causes, true character, and means of prevention, as no disease is more insidious in character or stealthy in its invasion in general than this, and none in which early and judicious treatment,—meaning thereby a treatment very different to that commonly pursued, and to which, I believe, its fatality in the majority of cases may be fairly attributed,—is of so much importance ; whereas, to judicious and early treatment this disease, in my opinion, is as readily amenable as any other

of equal severity, and more frequent occurrence. But the real nature of the disease and principles of treatment are not understood—on the contrary, mistaken notions on these subjects very generally prevail; not only with the public, but also among the profession. I speak advisedly in saying so, from observations I am constantly seeing put forth regarding them in the medical periodicals of the day; and from the particulars I have recently received from the medical attendants of a case of deep personal interest to myself, which terminated in untimely death, in India, last year, and which proper treatment, I feel confident, would have prevented.

With these facts and impressions on my mind, no apology, I repeat, is necessary, for my appearing again before the public as a counsellor on this very important subject; and without arrogating to myself any merit I do not deserve, or claiming for my opinion more attention than I have good reason to expect, I may be permitted to show cause, and which I shall presently do—why my opinion on the subject should be entitled, if not to respect, to more than ordinary consideration.

With regard to fever and dysentery, with which cholera is intimately associated, I may be permitted to say—that my opportunities of studying these subjects, also, have been more than ordinarily great. India is the place to study them, where diseases of this class prevail in their enlarged and more conspicuous forms, and where, as a medical officer of the Indian army for twenty years, and having held charge, for a period of four years, of the celebrated garrison of Seringapatam, where malarial fever is endemial all the year round, and exists in all its varieties, from the simplest form of ague to the severest species of yellow fever, I have had abundant opportunities of studying it—and dysentery also—in all their forms.

With confidence, therefore, thus derived, I beg leave to address a word of advice to all travellers on the continent of Europe, and

Europeans in general in India—where professional advice is not always available, to possess themselves of a copy of this work, and the few remedies I shall, in the Supplement, direct them to provide in case of need. In so doing they may not only acquire the very useful knowledge of the best means of escaping any such attack, but upon necessity be enabled also to afford timely assistance to a friend. Many travellers on the continents of Europe and America, as well as in India, fall, as I have reason to know, untimely victims of fever, either in its open or disguised form, or to erroneous views as to its character, and right treatment !

Now, with respect to my opportunities, both of observing and treating cholera, I may first mention that, during my service in India, as a sporadic disease of not unfrequent occurrence, and as an epidemic also, I had abundant opportunities of treating it ; and in proof of the interest I have taken in the subject, I may mention that I wrote on it as far back as 1819, when I first had the treatment of it as an epidemic. In 1828, I was the subject of the disease, and this a second attack, from which I had the good fortune to recover—when, having strictly attended to the progression of the symptoms, and my feelings, under this personal visitation, I was enabled to solve the difficulties I before laboured under, with regard to the explanation of the symptoms, and pathology of the disease ; in short, the knowledge I then acquired, operating upon my mind with all the force of the most perfect conviction, induced me to submit my views to the press at Madras, in an Essay entitled “ Cholera, Pathologically and Practically Considered.” This work meeting the approbation of the Commander-in-Chief of the Madras army, I was appointed to the charge of the head-quarters of the artillery,—and here I was the first to try injecting remedies into the veins, which was practiced afterwards in England ;—and next on my return to England for the benefit of my health in 1830, the disease having

extended from Asia to the eastern parts of Europe, I was induced to publish my further experience in an 8vo. volume, on "Cholera,—its Nature, Causes, and Treatment;" a work that was honored by translation into the German language, by the celebrated Professor, De Graef, of Berlin, and which work furthermore, after being submitted by the Court of East India Directors to Dr. Chambers, their professional adviser, for approval, was circulated among the medical officers of the three Presidencies of India. Soon after this I went, on the especial invitation of the late National Government of Poland, to Warsaw, where the disease was prevailing, and where, being appointed Physician-in-Chief to the principal hospital devoted to the treatment of this disease, I had for nearly three months continuously, from thirty to sixty cases under my observation and care. On my route to England from Warsaw, I visited many of the cholera hospitals of Germany, where the disease was generally prevailing; and soon after my return I published a pamphlet, containing the fruits of my further experience. I then revisited India, where, in 1832, I again saw the disease in one of its severest forms of epidemic invasion, and had frequent opportunities afterwards, till my final return home in 1837, of augmenting my knowledge on the subject, and which I have since still further investigated.

These are the opportunities I have had of studying and treating the disease, both in India and in Europe, and I think the attention I have devoted to it, has qualified me to give an opinion on the subject, as deserving of respect as that of any man living. I mention this not in arrogance, I trust, but merely to give weight to the observations and advice embodied in this work, which, from my perfect conviction of their truth, as far as principles are concerned, and very great importance to the cause of suffering humanity, and in supercession of any preconceived opinion my reader may have imbibed of a contrary nature, I am most anxious to see effectually carried out.

And, in conclusion, with respect to Fever, this "*ignis fatuus*" of most writers, I trust that I have stripped it also of its protean disguise, and advanced sufficient reasons why my opinions on this subject, also, have more than ordinary claim to attention ; and as such, will be accepted by my professional brethren in the spirit with which they are tendered—of earnest and disinterested desire to advance the cause of scientific practice, and the relief of suffering humanity—in the spirit,—that is to say,—of liberality and candour worthy of an enlightened profession !

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## INTRODUCTION.

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IN the construction of this treatise, I have endeavoured, in the few pages of which it is composed, to embody, in a style which may be understood by all classes, a comprehensive view of Cholera in all its bearings. First, as regards its nature; then its most frequent causes, and the operation of those causes in developing the symptoms; next, the indications of cure, as pointed out to us by Nature, and after this the remedies which principle directs and experience has proved to be most successful in its treatment. This is followed by a detailed account of the practice which should be pursued, from the first moment of visitation, and through the various stages of the disease, in all its forms, from simple diarrhœa to its severest species, including that, also, of dysentery; and, subsequently, the treatment of the inflammatory febrile affection, which so frequently succeeds to the attack of cholera, is also particularized; thus rendering the whole a complete, though concise, treatise on the subject, practically available to every person, professional or otherwise, in the hour of necessity. This is followed by the subject of fever, in which I have explained its phenomena, or pathology, its

varied character, as modified by its numerous causes, and the diversified circumstances under which it exhibits itself; occurring either as simple continued fever—as an effect of cold or of influenza, bilious fever, scarlet fever, erysipelas, rheumatic fever, typhus fever, &c., &c., and with respect to all of which, the treatment I have endeavoured clearly to explain.

Reverting to the subject of cholera, I would beg to be permitted to request, that those gentlemen of the profession into whose hands this treatise may fall, will do me the favour to carry out, fully and fairly, the treatment recommended, before they try any other. My recommendations are not only the result of deep consideration and great experience, but I have, in all cases, given a reason for them, such, I believe, as, in most instances, must speak to the common sense of the reader, and carry conviction with it; and if, what I have stated, warrants confidence, those who are called upon to treat the disease, are bound, by the common feelings of humanity, to adopt it. I have further explained, and I trust I have done so satisfactorily,—why the disease, when allowed to progress, is so commonly destructive. The explanation I have given is simply this, that, in this disease, the blood-vessels of the stomach and bowels, which, in health, are the vessels principally concerned in absorbing into the system the nutritive juices from these organs, are now, from being in a state of engorgement or congestive

fulness (which universal observation testifies is the case in this disease from an early period of its invasion), rendered quite unequal to the performance of this process of absorption—their ordinary and very important function ; and that, from this cause, not only is the supply of nutriment cut off, but the introduction of our remedies into the system, by absorption from the stomach for its relief, is prevented also : making good the remark of some observant practitioners in India, that “ remedies appeared to have no more effect, when received into the stomach, than if they had been put into the coat pockets of the individual,”—an observation strikingly in point, and the cause of this congestive distention, explanatory of the source of the fluid evacuations, which are simple exudations from these over-distended vessels.

These I would regard as curative efforts of the system, in relief of the congested vessels ; but which, not being so understood, it has been but too commonly the practice to arrest by opium, and, of late, by the poisonous influence of lead ; also affording another reason why the disease has been so generally fatal. With this impression on my mind, I have felt it a duty to publish this work, and which, as adverted to in the Dedication, has been honored by the patronage of the Court of Directors of the East India Company ; and I here call upon the press generally to aid me in its circulation, at the same time that I call upon the profession and all

mankind either to confute me in argument, or to exhibit, by facts, reasons why the practice enjoined, and treatment I have recommended, should not be accepted as deserving universal adoption !

And, finally, upon the subject of fever, I trust it will be found that I have robbed this “ will-o’-the-wisp ” of its protei-form disguise, and exhibited it in its unsophisticated character, not as Broussais and Clutterbuck have taught, as the consequence or effect, at all times, of inflammation, but as a reality in itself—a condition of the circulating system, which I have denominated that of *irritation*—an excited condition of the small vessels, intermediate between that of active inflammation and the passive condition of congestive repletion ;—a condition of the general system which may be brought about by a great variety of causes, but all referable to two distinct heads, which afford the two leading principles of treatment, applicable to all cases. The subject is one of importance, and of great interest, involving the treatment, not only of this very numerous class of human ailments, but that, also, of most others, and, as such, the views advanced I trust will be found deserving my professional reader’s best attention.

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“ Man, the servant and interpreter of Nature, can only understand and act aright in proportion as he observes or contemplates the order of Nature—more he can neither know nor do.”—*Bacon*.

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## CHAP. I.

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# CHOLERA,

### *Its Nature, Causes, and Prevention.*

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**Cholera.**—Without entering into any explanation of the meaning of this term, which is variously applied, I shall, after saying a few words about its most frequent causes, describe the character of the disease we have in view—what are its distinguishing symptoms, and the order of their progression.

**Epidemic Cause of the Disease.**—This disease, which has continued to prevail as an epidemic in eastern countries since the year 1817, and has been so fatal in its consequences in our Indian possessions, and where, at Kurratchee, it has recently destroyed a fourth part of the population, including nine hundred European and native soldiers, in a visitation of sixteen days; and which, also, as an epidemic, extended its ravages, a few years ago, to this country, as well as throughout the continents of Europe and America;—without offering an opinion as to the particular causes of such epidemic visitations of the disease—although

at the end of this chapter I shall add a few remarks on the subject,—I may venture, without fear of contradiction, to say, that the influencing cause consists in some condition of the atmosphere, which operates by reducing the active powers of the system, and subverting the normal or natural healthy manifestations of life, and may, therefore, without impropriety, be called poisonous.

**Ordinary Cause.**—Sporadic and locally engendered cases of this disease, or one precisely in character with the epidemic in all its leading features, though in general less in degree of severity, have, however, always been of frequent occurrence in hot countries, and in this, also, during the autumnal months; from the combined effects of debility of the system and derangement of the biliary and associated organs, which so generally ensue from the preceding hot weather,—and malaria, which, at that season, is so much more abundantly developed by the agency of heat, and issues from drains, sewers, or wherever animal or vegetable substances exist in process of decay; its effects being, however, more particularly manifested in damp, filthy, low, or confined situations;—the individual in the condition of predisposition to disease above mentioned, being exposed to its influence, and inhaling such malaria, having his blood, it may be said, truly poisoned thereby.\*

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\* Extract from the *Times* of Nov. 2nd, 1846 :—“ We have a table of the Registrar-General before us, of the deaths in 115

**Nature of Malaria.**—Sulphuretted hydrogen, one of the offensive gases issuing from sewers, and a product of the decomposition of animal and vegetable substances, is so truly poisonous to the animal system, that a bird, or other small animal, exposed to an atmosphere containing but one fifteen

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districts in England during the quarter of the present year, ending with the month of September; 34 of these districts are in London, the remainder embrace the principal towns and cities of England. From this document it appears that the number of deaths during this last quarter was 51,000, being an increase of more than 15,000 upon the corresponding quarter of last year. In London the increase is 14 per cent.; in the other 81 districts it is as much as 52 per cent. In Birmingham, where the deaths were last year 694, they have risen to 1627, in 1846. In Liverpool and the adjacent districts, from 2,595 to 4,090. In Manchester, Salford, and Chorlton, from 2,411 to 4,248. In Sheffield, from 445 to 1,039. The causes of this extraordinary mortality are attributed in part to the high temperature of the summer months, the average of which was six degrees above the corresponding season of last year. Of the accuracy of this conclusion no doubt can be entertained, when it is understood that, in the first week of August, when the thermometer stood high, 1,100 deaths were registered in the Metropolis alone. The Metropolis affords also another proof, in which, among the excess of 1,567 deaths, 1,303 were from diarrhoea, cholera, and dysentery, diseases which the learned Sydenham observes, 'are accustomed to prevail at that part of the year when the summer is passing and the autumn approaching.' Other agents, however, contribute to the result—crowded lodgings, personal uncleanness, the concentration of unhealthy emanations from narrow streets without fresh air, or sewers—these poisoning the genial air, and converting the warmth of summer into a poison blast."



hundredth part of this gas, dies almost immediately from its effects; and a horse has been killed by exposing it to breathe an atmosphere containing but one-250th part. That malaria, which is a compound of this and some other gases equally noxious, developed by the decomposition of animal and vegetable substances, wherever they exist, may be truly affirmed to be a poison; and which, under certain conditions of the atmosphere and states of the system, will produce cholera; and under other circumstances of exposure to its influence will occasion typhus fever, dysentery, scarlet fever, erysipelas, rheumatic fever, influenza, or other modification of fever of a remitting type with local affection—either of the brain, lungs, or abdominal organs. The various states of the system, age, season of the year, condition of the atmosphere, composition of the malaria, its virulence, and length of time the individual may have been exposed to its influence—all being modifying circumstances influencing the result, or disease, to which it gives rise.

**Symptoms of Cholera.**—The symptoms of cholera, commensurate with the circumstances of the case, the previous state of health and constitution of the individual, the length of exposure to the poisonous cause, its particular nature and virulence, the state of the atmosphere, and other adventitious circumstances, may, therefore, come on suddenly, or stealthily; and thus may the pa-

tient be suddenly seized with giddiness and prostration of power; or watery purging, oppression about the stomach and bowels, and sense of general weakness, followed by vomiting, coldness, and cramps in the extremities; or the latter classed symptoms, coming on as simple diarrhœa, or indigestion, may be progressively developed, involving a period of several hours, or some days' duration, before they become alarming in their character.

**Most frequent form of the Attack.**—The disease, however, usually, comes on insidiously by loose purging, attended by a sense of malaise—or feeling you hardly know what is the matter with you—languor, giddiness, loss of appetite, flatulent distension of the stomach, and chilliness, sometimes attended with shivering, succeeded by thirst and feverish heat, and followed by cold perspiration; the purging gradually becoming more frequent and watery, and at length nearly colourless, like barley or rice water; the stomach, from a sense of distension, becomes oppressed, and vomiting generally follows. The sense of fulness and oppression about the stomach and bowels extends, also, in some cases, to a feeling of pain; oppression of breathing and head-ache are also frequently complained of; and muscular pains are sometimes felt in the back and limbs, or cramps in the fingers or lower extremities, extending occasionally to the belly or chest. Increasing coldness and extreme prostration follow, with hollow sepulchral voice and deafness, the

breath becoming cold and respiration feeble, the patient often, at the same time, complaining of a sense of inward heat, calling for cold water, and throwing off the bed covering from oppression and extreme restlessness. The countenance, progressively, from an early period of the disease, becomes sombre, sunken, and dejected, and ultimately assumes a leaden hue, it first becoming so around the eyes and mouth; the patient now often lying in a comatose state, with the eyelids half closed, and the whites of the eyes turned upward.

These are the principal symptoms, and the order of their progression. To comprehend clearly the measures necessary for their treatment, it is indispensable to understand how they are induced, and this, accordingly, will next engage our attention.

**Warmth of the Body, how maintained.—**

The vitality of the animal system and warmth of the body are always proportionate and coincident. When the warmth of the body is reduced, the pulse, marking the force of the heart and circulation of the blood, is reduced also, and all the vital actions are diminished likewise in the same degree. Vitality is obviously, therefore, if not dependent upon, yet coincident with, the body's temperature: what will reduce the one, will diminish the other also. The maintenance of the body in its due warmth—that is, in its natural and equable degree of heat—is, then, the great secret of the maintenance of life. How, then, is this temperature in health at

all times so uniformly maintained? It is precisely by the same means as we maintain the fire in the grate. How, then, is this? The fire is maintained by the agency of the air, or, rather, one of the constituent parts of the atmosphere—oxygen gas, which, uniting chemically with the coal, a compound substance of carbon and hydrogen, generates, or rather gives out heat in the process. Coal, when heated to incandescence, combines with the oxygen of the air, and forms carbonic-acid and water, and heat and light are evolved by condensation of this gas in the process; the heat perpetuating the combustion as long as the necessary materials—coal and air, or carbon, hydrogen and oxygen, are furnished for combination; and the carbonic acid and other products of combustion are allowed to make their escape.

**Life, or vital action, how maintained.**—In the animal system precisely the same process of combustion takes place as in the fire; or in another form, as in the candle, which gives us its light: hence the necessity for our uninterrupted breathing; and this explains why hanging, drowning, *burking*, or other mode of cutting off the supply of air from the system, like applying the extinguisher to the candle, is so immediately destructive of life; and it affords a reason why, as the skin performs the same respiratory function as the lungs, an animal, on having its skin plastered all over with an impenetrable composition, and thus cutting off the access

of air to its surface, immediately becomes cold, and dies in two or three hours. It explains also the necessity which exists for our taking food, which consists principally of carbon and hydrogen, three or four times a day, that we may supply the fuel necessary to maintain this vital combustion; although, in cases of exigence by disease, and privation of food, the fat of the body and other textures of the system will supply, for a limited period, the necessary fuel;\* and this constitutes the difference between the privation of food and of air. We cannot bear the privation of the latter for a single minute, and hence Nature, with her usual providence, has surrounded us with it on every side; whereas the former, of which we can bear the privation for a lengthened period, is only to be obtained by exertion, "the sweat of the brow," according to the decree of our Creator, exercise being essential to the well-being of our nature—the due performance of the bodily functions. The principal constituents of food, I repeat, whether for man or beast, are accordingly carbon and hydrogen. Bread contains thirty per cent., potatoes twelve, and butter or fat nearly ninety per cent. of these elements. These, then, in admixture with water, are received from the

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\* This was strikingly exemplified in the well-attested case of the fat hog immured by a fall of a part of Dover Cliff, it having survived its incarceration without food 160 days, and losing, during this period, 120 lbs. in weight!

stomach and bowels into the blood ; and air is received also into it, from the lungs and skin, through which channels it is imbibed. These now combine, as constituents of the blood, during the course of its circulation, and form, by their union, carbonic-acid and water, and give out heat and electricity in the process ; like the combustion of the coal in the grate which gives out light and heat.

Light, there is great reason to believe, is but another form of electricity—and this a modification, or another form of caloric—or the matter of heat :\* whether this be so or not, experiment has proved that electricity is so evolved, during the combustion or chemical union of carbon or hydrogen with oxygen ; in like manner as the oxidation of the metal, or union of the oxygen of the water with the zinc, in the ordinary galvanic apparatus, develops electricity ; offering a striking illustration and the analogue of what takes place in the first instance. And thus, by the combustion pointed out, is the heat of the body maintained ; and by the electricity—a motive power developed in the same process—is motion or vital action imparted to the system ; and as heat and motion are the characteristic attributes of vitality, life is thus maintained. Hence the equability of the temperature and vitality of every part of the system, and a

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\* See Professor Farrady's recent experiments ; and Professor Grove's Lectures on the Correlation of Physical Forces.

reason why they are always proportionate to each other and coincident. And it affords, also, a reason why poisonous agents, or those which when received into the system subvert or arrest this process, or other cause which operates in like manner, as that of diminishing the supply of oxygen, or intercepting the exhalation of carbonic-acid—a poison from the blood, are so immediately destructive to life.

**Operation of Malaria.**—The poisonous influence of malaria, as the ordinary cause of cholera, or the condition of atmosphere, whatever it may be, which gives rise to its epidemic prevalence, operates thus in both cases, by subverting this process, and diminishing the vital combustion,\* and reducing thereby the active energies of the system, this being the primum mobile, or main-spring of all the functions. In thus viewing the operation of malaria, or cause, or causes, whatever they may

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\* “The temperature of the body in general undergoes a more marked reduction in cholera than in any other disease; the thermometer, instead of standing at 98°, as in health, has fallen to 84°, 79°, and even to 72°. The reduction of temperature extends even to the blood, for a thermometer, introduced into the cephalic vein, has fallen to 88°, 84°, and even to 82°. In almost all cases the chemical action of the lung has been greatly affected, the breath being so cold, that the thermometer placed under the tongue, has fallen to 87°, and the air expired is also deficient in the usual proportion of carbon, and the oxygenation of the blood evidently impaired.”—Dr. ROBERT WILLIAMS, *Elements of Medicine*, vol. 2, folio 637.

be, which immediately give rise to the disease, a simple and satisfactory explanation is afforded of all the phenomena of the affection ; but before proceeding to trace its operation in developing the symptoms, I must revert to the subject of malaria, and draw attention to some other circumstances of importance, influencing the result, or disease, to which it gives rise.

**Sources of Malaria.**—The ordinary cause of the disease I have stated to be malaria, or the poisonous exhalation from the decomposition or putrefactive decay of animal and vegetable substances, issuing from sewers, drains, and other foul sources. We must not, however, confine our ideas to the immediate or direct decomposition of such substances, or to the sources that I have mentioned exclusively ; the exhalations from marshes, or the paddy grounds of India, from jungle or forest, as well as from the uncleanly persons of both men and animals, or the deteriorations of the air by respiration in crowded apartments, and imperfectly ventilated or confined situations, are quite equal, in certain conditions of the system, to produce the same effects, viz., cholera, or, as I have before said, under other circumstances, typhus, or remittant fever, these diseases, under ordinary circumstances, having the same common origin, and being intimately associated in character ; and hence, the latter in India, and the former in Europe, frequently becomes the sequel of the former affection. To be



attacked with the disease, whether cholera or typhus fever, it is not, however, necessary to be a resident of any such foul or unhealthy locality as we have mentioned ; sufficient to produce the disease, is a single inspiration of the poison when virulent, under certain predisposing conditions, or great susceptibility of the system ; and hence the frequency of this affection, as I before said, in the autumnal season, when biliary derangements and debility, as predisposing causes, are common. Thus, a person walking the streets, and merely inhaling a whiff of this aerial poison, or foul exhalation, as it emanates from a sewer or drain, if he be in a state of high predisposition, may become affected with the disease ; whereas another, passing daily the same ordeal in a state of health, or condition of system of less susceptibility, will escape it, and be deranged, if at all, perhaps, in the stomach or bowels, to the extent alone of its inducing indigestion or diarrhœa, or his being otherwise disordered in a slight degree.\*

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\* That predisposition is a very important element to the development of the disease, was very strikingly manifested at Kurratchee, the 86th regiment, from circumstances of this kind, fatigue and privation, succeeding to a long march, having been the first to be attacked, and losing more than double the number of men to any other regiment present ; and that extreme humidity of the atmosphere, a condition attended with a low barometer and diminished electrical tension of the air, is an occasional cause, and was the immediate exciting one of this epidemic visitation of the disease at Kurratchee, is rendered extremely probable by the accounts recorded of its occurrence, *and appended in the Supplement.*

**Predisposing causes of the Disease.—**

Predisposition, or susceptibility to influence, is, therefore, one of the conditions essential to the operation of the more baneful influence of this poison ; and hence, likewise, the importance of not only avoiding, as much as may be, every source of the air's pollution, but also of paying great attention to diet, sleep, warmth, exercise, and every circumstance conducive to health. It is for this reason that raw vegetables, sour fruit, and indigestible substances of every kind, as well as intoxicating and sour beverages, have the reputation of inducing the disease. It is not that they induce the disease, but they disorder the system, and render it amenable to attack. In the same manner, exposure to great heat, by deranging the biliary system, or to the influence of cold, by which the very important function of the skin is disordered, is also another very frequent exciting or predisposing cause of the disease ; hence great care should be taken to avoid all exposure of the kind, and the healthy function of the skin should be insured by sponging with cold water the whole surface of the body, including the head, every morning on getting out of bed, and well rubbing it with a coarse dry towel for some minutes afterwards ; or the shower, or the plunging bath should be made use of, or the tepid should be used occasionally when the former is objectionable. Fatigue, and exhaustion of every kind, and particularly such as follow debauchery, or intoxica-

tion, from the reason of their debilitating and deranging the healthy functions, are very frequent causes of the attack. Moderation, therefore, in all things, cannot be too urgently insisted on, and this must extend to eating and drinking also, that the stomach and bowels may not be oppressed either by excess of quantity or objectionableness of kind. Night air, contaminated as it frequently is by the exhalations of the earth, raised by the heat of the day, and now returning to it condensed and humid, is equally to be avoided. "Early to bed, and early to rise," is, therefore, an excellent maxim, and, when this disease prevails, cannot be too scrupulously attended to; and sleeping in and occupying the upper rooms of a house is also advisable; and last, though not least in effect, among the number of predisposing causes of the disease, may be mentioned fear and perturbation of mind. Have confidence, therefore, and feel assured that, with respect to this disease, there is nothing to be feared from the attack, should it really occur, provided early and proper remedies be had recourse to; avoid, likewise, excess of mental application, and take as much exercise in the country and pure air as possible, short of producing undue fatigue.

**Remedy in Prevention.**—In conclusion of this part of my subject, I must, however, add, that, from the force of circumstances in which some persons are placed, in despite of their best endeavours to prevent them, derangements of health will, never-

theless, take place ; in which case, in the majority of instances, the following pills will be found a most excellent remedy :—Calomel, soccotrine aloes, and Castile soap, of each twenty grains, made into twelve pills. One, taken at bed time, for an adult person, for one, two, or three nights ; or the half of one reduced to powder, and mixed with a little jelly for a child ; will increase the secretion of bile, and tend thereby to purify the blood, open the bowels, and excite all the functions, and in thus acting will, with suitable abstinence, materially prevent the accession of cholera, or any disease ; and further, should it fail in so doing, it will, nevertheless, prepare effectually the way for such other treatment, as the case may be found more essentially to require.

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*Upon the nature, causes, and prevention of the disease, I have said all that I think necessary ; and beg leave now, by way of illustrating and confirming, in various particulars, the views propounded, to refer my reader to the account in the Supplement of the epidemic visitation of the disease as it occurred at Kurratchee in June last. And it is here, also, while the connecting links of the subject are fresh on the mind, that the remarks on the epidemic cause of the disease, as well as those I have offered in proof that the disease is not contagious, may be read with the greatest advantage ; to which subjects, to be found in the Supplement, I beg leave, therefore, to direct my reader's attention.*

## CHAP. II.

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*Explanation of Symptoms, Operation of Remedies,  
and Indications of Treatment.*

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**Explanation of Symptoms.**—Reverting to the explanation, given in the last Chapter, of the cause of the disease, I repeat, that this cause operates, by subverting and arresting those fundamental processes of life—by which the temperature of the body is maintained, and vital motion or action is imparted to all the functions of the system, and especially to those which are essential to the maintenance of these fundamental processes. The blood, in which these chemical changes take place, being poisoned, as we have pointed out, or otherwise deteriorated in quality, impairment, or arrest, of these vital processes ensues; and thus, the vitality of the entire system being reduced, the symptoms are, accordingly, those of general depression, with such others as arise out of this condition; or depreciation of all the active powers or functions of the organs which are associated in the maintenance of life. [The purely pathognomic, or characteristic symptoms of the disease, the writer of the account of it in Scinde observes—“were loss of nervous power and weakened circulation, tending to collapse.”] Of the above important functions,

that of the heart, or organ by which the blood is circulated, or kept in free motion, stands pre-eminently the most conspicuous. The heart's power being thus reduced, the blood is not freely circulated, and stagnation, or congestive accumulation of blood in certain of the vessels takes place, and in those vessels more particularly in which the circulation is most feeble or those the most remote from the heart's influence—or power of keeping the blood they contain in free circulation, and which is most especially the case in the veins of the stomach, bowels, liver, and spleen; and here, accordingly, stagnation of blood, or congestive fulness of the vessels, more particularly occurs, as I shall now make evident.

**Peculiarity with respect to the Blood's circulation in the Liver.**—The blood, to all and every part of the system, excepting to those organs in connexion with the liver, is circulated by the heart's contracting on its contents, and propelling the blood through the vessels connected with it, called arteries, to the part wherever situated, and it thence returns direct to the heart by the veins, in communication with the terminal branches of the arteries; the blood being impelled, on its return to the heart, by the heart's dilatation, or sucking power, thus drawing it into its cavity, aided by the superincumbent pressure of the air ab externo, and the action of the organic or intermediate series of capillary vessels; but of which, as not bearing upon

the matter before us, I have taken no notice. This is the simple and ordinary mode by which the blood is circulated through the system in general ; but not so with respect to the liver and organs associated with it. In this case, the blood is propelled by the heart to the stomach, bowels, and spleen, in common with all other parts of the system ; but, instead of the veins from these organs returning the blood directly to the heart, as in all other cases, these veins all unite into one common trunk, called the portal vein, which now again subdivides into innumerable streamlets, circulating this blood, (coming from the stomach and bowels for purification,) through the liver ; and which blood, after being thus a second time circulated, and purified in the process, is again collected in another series of small vessels, which finally unite into one large trunk, called the hepatic vein—this returns it to the heart. In the intermediate series of vessels, or those situated between the veins of the liver and the arteries of the bowels, must the heart's power of circulation, or influence over the blood, accordingly be less felt than in any other part of the system ; and in these vessels, therefore, whenever the heart's power is reduced, must congestion, or venous accumulation of blood more particularly take place.

**Explanation of Symptoms continued.—**

From the previous consideration, it is obvious that, in this disease, which is more especially characterized by prostration of power, will stagnation of blood

in the liver and engorgement of the vessels of the stomach and bowels and spleen take place; and hence the feeling of stuffing and oppression so generally felt in these parts in cholera, and other affections of like character. And next, as these vessels of the stomach and bowels in health are those destined to absorb, or suck into them, the fluid nourishment from the stomach and bowels, they now, on the contrary, from their engorged state and extreme fulness, exude, or pour out into the bowels, the aqueous parts of the blood, or a portion of their more fluid contents; and thus the watery evacuations, whether from the stomach, or bowels, or from both, are very simply and satisfactorily accounted for. As it is from this blood of the bowels, which should have circulated through the liver, that the bile should have been secreted, as it remains here stagnant no bile can be secreted or formed,—and as it is to the presence of bile, which flows from the liver as it is secreted into the bowels, which gives colour at any time to the evacuations,—it is obvious that, in proportion to this stagnation of the blood, and arrest of the secretive function of the liver, so will the evacuations be more or less colourless, and thus mark, which it does, the severity of the more ordinary forms of the disease; and not this only, but the amendment likewise, as it takes place—bile becoming secreted and imparting its colour to the evacuations in the progress of successful treatment. And it moreover, and at the



same time, affords a valuable indication of treatment—in short, we are thus directed by Nature, in as clear and forcible a manner as possible, to the true indications of treatment; for in restoring the secretive function of the liver, we not only purify the blood, or tend so to do, of its poisonous contamination, and remove also this stagnant accumulation, but add, at the same time, vitality to the whole system, by restoring this stagnant amount of the vital stream to general circulation. And, in addition to these indications, I maintain that Nature has even further directed us as to other measures which should be pursued in the treatment of this disease. I here allude to the evacuations which attend the disease, which are also, without question, curative efforts of the system, in relief of the distended vessels of the stomach and bowels, and tending to expel the poisonous cause. The vomiting, also, is of like character, an effort to relieve the stomach and impel the blood forward in its circulation through the liver. In confirmation of these views, I may mention that, in India, the severest form of the disease is found to be that without vomiting or purging, the patient being suddenly seized with giddiness and extreme prostration (the same is mentioned to have occurred at Kurratchee), and dying in a few hours, from overwhelming congestion of blood in the brain, as from apoplexy. And the same views are further illustrated by the operation of remedies, bleeding, eme-

tics, and purgatives having proved infinitely more successful than the opposite class of agents, opium and stimulants, which restrain evacuation and paralyze the natural endowments of the system.

A theory, to be correct, should explain every possible condition embraced in its character. It may be asked how a symptom, which is characterized as one of the pathognomic of the disease in the 86th regiment at Kurratchee, namely, cold sweat, and to an extent that the clothes of the patient were wringing wet, is to be accounted for? The evacuations from the stomach and bowels I have endeavoured to make apparent, are simple exudations from the blood of the congested vessels of these organs; and cold sweat is of the same character—an exudation from the vessels on the surface of the body, occasioned by the more sudden and greater intensity of the exciting cause of the disease. The immediate prostration of the heart's power, and capillary action upon the surface, occasions this result, before the system has had time to bring about the local congestions of the vessels of the stomach and bowels, which ordinarily ensue; and hence, too, the fact mentioned, that the evacuations from these organs did not occur, or were seldom to any great extent, as in the more frequent visitations of the disease. These views are well exemplified by the ordinary effects of blood-letting to faintness, or the production of the same effects by the administration of a half poisonous dose of

tobacco, in either of which cases cold sweat, as the effects of general prostration, immediately ensues.

In confirmation of the indications propounded, I beg leave here to adduce the following extract from Dr. Kennedy's recent publication, as the fruit of his lengthened experience as an Indian practitioner in the treatment of the disease :—" I consider a nervous derangement, similar to concussion of the brain, to be the disease, how induced I know not, following the inexplicable shock sustained by the constitution ; and the collapse and spasms to be symptomatic of the disorder of the brain ; and, finally, I consider the purging and vomiting to be no part of the disease, but the struggle and efforts of Nature to relieve the constitution, and cast off the noxious principle which is destroying it. For the treatment of such a disease, the indications are distinctly apparent—to relieve the brain by bleeding, and to induce the sanatory process of vomiting and purging when they do not exist, or to moderate them when violent," pp. 56 and 57.

**Indications of Treatment.**—Taking Nature for our guide (and, in so doing, I can say, as the fruit of more than thirty years' observation and professional experience, we can never err), the indications of treatment are obviously to excite the secretive function of the liver, and to remove the congestive accumulation of blood from the vessels of the stomach and bowels. These are the chief indications, and speak at the same time to every

man's common sense as to their propriety. Another indication presents itself to our notice, which is to supersede or neutralize the poisonous agent or cause, with which the vital stream has been contaminated, by the introduction into the blood of some other agent of an opposite description or antagonist character. These are clearly the indications of treatment, and the whole of them, under ordinary circumstances. But, under extraordinary circumstances, as in the epidemic visitation at Kurratchee, or in severe cases, I should add, and strongly advise, augmenting the amount of vital air in the system by the inhalation of oxygen or the nitrous-oxide gas ; inasmuch as the epidemic cause, in the instance alluded to, must directly and immediately have diminished the amount of oxygen inhaled, and arrested, also, the exhalation of carbonic acid gas—the product of combustion from the system ; and in thus operating must have virtually poisoned the blood, and for which, in either case, oxygen would prove a direct remedy. Independent, however, of the above views, there are others which still more strongly point out to us the necessity and importance of this remedy in all severe cases of this disease ; for whether the cause operate from without the system, in diminishing the supply of oxygen or the exhalation of carbonic acid, or from within it, in diminishing the power of the organs concerned in the absorption or reception into the system of the one, or the expulsion of the other, the effect

is virtually the same in both cases. And as the disease progresses, the coldness and inertia of the system point out to us but too clearly that this—the respiratory function, the primary one of life—however affected, is seriously impaired; this remedy—the introduction of oxygen into the system, cannot therefore be too strongly and earnestly recommended to adoption, and it is as much the duty of the medical attendant to prescribe as any of ordinary and more frequent application. Of the ghastly and livid hue which characterizes the countenance, like that of a person suffocated, and often pervades the whole body of those affected at an advanced stage of the disease, the above view offers at once an explanation.

Our next object is to show how the several purposes thus indicated may be best fulfilled.

**Remedies—Calomel.**—With respect to the first-mentioned indication (restoring the liver's function) universal experience testifies, that calomel has a direct and immediate exciting effect on the liver, increasing its secretion and the flow of bile into the bowels; and further, universal assent will be given by the profession to the fact, that it not only excites the secretion of bile, but all the secretions; and if it excite all the secretive organs, it must necessarily act generally upon the system, and excite all the functions, including those of the heart and brain. That it does so, thirty years' experience justifies me in confidently asserting, the pulse manifesting its exciting operation. And fur-

ther, as it can only thus operate in admixture with the blood, into which it must be admitted by absorption from the stomach, it must of necessity operate, as it is a stimulant, as an antagonist agent also, in supercession of the depressing influence of the poisonous cause of the disease ; and if this be the case, it is a remedy to which we might, under ordinary circumstances, apply the term specific in the cure of this disease ; and, as the fruit of all my experience, I fearlessly aver, that it is as much so as it is possible any single remedy can be. But there are circumstances, in the advanced stage of the disease, which stand in the way of its operation, not, however, of this only, but of any remedy we may desire to introduce into the system by the usual channels of the stomach and bowels ; and it is to this circumstance, in my opinion, and not to the want of efficient remedies, that the disease has proved so lamentably destructive. How this arises may be thus explained :—Absorption of nutriment, and of all things entering the system from the stomach and bowels, the experiments of Majendie upon animals most satisfactorily prove, is effected, or principally so, by the imbibition of the veins of these organs ; and he further proved that this imbibition by the veins of the stomach and bowels, and in short of absorption from all the surfaces of the body, was carried on or effected in the inverse proportion to their distention—that is to say, in proportion to the fulness of the veins will their

absorbing power be diminished. Now, as we have before exhibited, the veins, which are the principal absorbing vessels of the stomach and bowels, are in that extreme state of congestive distention with blood, that they are transuding or effusing their more aqueous contents, and hence the fluid evacuations : absorption, consequently, must be at a perfect stand still, or nearly so ; and, accordingly, put what you will into the stomach, at an advanced stage of the disease, no effect can follow : making good the remarks of some observant medical officers of India, “ that remedies had no more effect when taken into the stomach than if they had been put into the coat-pockets of the individual.” And thus we account for the want of success which has so generally characterized the treatment of this disease ; and we further explain how, at an earlier period of the attack, large doses of calomel are absolutely necessary to fulfil the ordinary effects of small ones, little of it being absorbed into the system. And it is at the same time manifest that a large dose of calomel, administered, as it so frequently is, in conjunction with a large dose of laudanum, must be utterly useless, in as much as the latter, being a fluid, and diffused over a large portion of the stomach’s surface, may be absorbed, or partially so—while the former, a comparatively insoluble substance, must remain as useless, or nearly so, as a stone. Independent of which, as general experience testifies that laudanum, a se-

dative agent, or other preparation of opium, is contra-indicated in congestive disease, we need not be surprised at the want of success which has attended the practice.

**Bleeding.**—I am now led to speak of another remedy, which has a direct effect of unloading the congested vessels, and thereby of facilitating absorption—this is bleeding, which, although not always indispensable, is clearly a remedy when *judiciously* employed, from which much benefit may frequently be derived, and which general experience has proved to be the case. If, therefore, there be oppression of breathing, pain, or much fulness about the region of the stomach and bowels, or pain in the head, or severe spasms, bleeding should be had recourse to, the blood being withdrawn from the patient in the recumbent posture; the quantity being limited by its effects on the pulse, it being continued to a pint or more, if the pulse improves under the operation, or otherwise the blood's flow being arrested if the pulse falters in consequence; and repeating it, or not, as circumstances, hereafter to be pointed out, may indicate the necessity.

**Saline Clysters.**—In furtherance of the same intentions—that is, of unloading the congested vessels of the stomach and bowels, and favouring absorption—another remedy, of great value, is saline clysters. A large teaspoonful of table salt, dissolved in a pint of warm gruel, or water, and used as a clyster every half hour, the patient continuing, at



the same time, in the recumbent posture, and passing it, afterwards, into a cloth, at his pleasure, cannot be too strongly advised; and especially so when vomiting is frequent, or spasms are severe. We thus, by increasing the excretions from the bowels, aid Nature in her efforts, and, in so doing, allay irritation, relieve the head, tranquillize the stomach, and promote the absorption of the remedies administered, which otherwise are often rejected.

**Emetics.**—And next, in order to increase the circulation through the liver, and remove the stagnant blood from the vessels of the stomach and bowels—increasing thereby the absorption of the calomel, and withal clearing the stomach, that it may be brought effectually into contact with the surface of the stomach for absorption—an emetic is another very useful remedy. Nature moreover points this out to us, by the vomiting which so generally attends the disease; and in further proof of the utility of vomiting, we have the fact, that emetics, by some practitioners in India, as well as by some of the natives of that country, have been exclusively employed in the treatment of this disease, and with very considerable success. We have, in addition, the testimony of the Governor of Scinde, who, in a letter to a friend, mentions that, at Kurratchee, “Some were cured, as they imagined, by constantly drinking cold water; it first produced *vomiting*, and, finally persevered in, *cure*.” And, accordingly, it is my advice, that the treatment, in all cases, should

be commenced with an *emetic*, combined with a due proportion of *calomel*,—that no time may be lost in bringing the latter remedy into operation. As an emetic, the tartrate of antimony, or emetic-tartar, the remedy so successfully employed in India, may be very properly recommended. I advise, therefore, ten grains of calomel, with two of emetic-tartar, and of conserve of roses sufficient to make the whole into six soft pills; one to be given every half hour, till the whole have been taken. These pills will not only excite vomiting, but in this act propel the blood to the surface of the body, and tend thereby to excite also the perspiratory secretion. After the operation of the pills, the treatment should be followed up with the calomel alone, in doses proportionate to the severity of the symptoms, from two grains to twenty every hour, or oftener, in extreme cases, taken in powder; conjoining with it the use of the saline clysters, which need not be commenced till after the pills have all been taken, and which may be gradually omitted as the patient improves.

**Nutritive and other Injections.**—I must now observe, that the efficiency of the lower bowels as an absorbing surface, in an irritable state of the stomach, and in certain conditions of the system, has not been duly appreciated, and which, I am of opinion, in this disease more especially, may be turned to the very best account. The following cases will strikingly exhibit what may be done in

this way:—suffering severely from sciatica, I was induced—having, on former occasions, often obtained relief by taking a couple of grains of opium—to try what the more local application of this remedy would accomplish, and with this view I introduced a couple of grains of soft opium up the anus, the full effect of which was experienced in a couple of hours, but with so much greater intensity that, in the morning, after a profound night's repose—the remedy being applied in the evening—I could not move my head from the pillow without puking; in short, I was in the condition of an inebriate after a night's debauch. On another occasion, a patient, suffering from delirium tremens, cut his throat with a piece of a quart bottle, making a deep lacerated wound extending to the œsophagus, and this being followed by inflammation, the irritability of the gullet was so great that nothing could be swallowed, nor from the irritability of the parts could a tube be introduced, and the man was fast sinking by exhaustion, when I directed half a pint of warm milk to be injected into the bowels, and the same, alternated with as much beef soup, to be repeated every two hours. Within the short period of two hours, the pulse had much improved; the man being well supported by these means, the inflammation subsided, and he soon got well. I am particular in mentioning these cases, as I am strongly impressed with the opinion, that much more may be accomplished, than has yet been done in this

disease, by the introduction of our remedies into the system through this channel, for reasons given under the head of calomel. As a substitute, therefore, for the saline clysters, I should strongly advise, in a more advanced stage of the disease, or in cases where the evacuations have been copious, and the patient much exhausted, the injection of half a pint of gruel, milk, beef tea, or the like, with a tablespoonful or two of brandy—a practice that was very successfully employed at Kurratchee; and I should further advise (addressing myself now exclusively to the profession) adding to the same, for reasons given in the note at the foot of the next Chapter, a weak solution of the bichloride of mercury—one of the most powerful stimulants we possess; a grain being dissolved in an ounce of brandy, a teaspoonful of the solution, or the eighth part of a grain, to be added to each injection (or two, if the pulse be exceedingly feeble), and repeated every hour, or oftener, if soon rejected; and in the advanced stage of the disease, or cases of extreme exhaustion, when a little opium may with propriety be administered, adding to the clyster twenty or thirty drops of laudanum.

## CHAP. III.

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*Treatment of Cholera, in all its Forms.*

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**General Treatment.**—Having pointed out the operation and influence of the principal remedies, and the indications they severally fulfil, I must now, before recommending them to practice, point out some preliminary measures, which are of great importance to the successful application of these remedies. The first thing to be done in all cases of this disease is, that the patient at once retires to bed ; a comfortable feeling of warmth, and the recumbent posture in an airy chamber, are indispensable auxiliaries and pre-requisites to all treatment ; and these precautions are to be strictly observed throughout the case :—that when the bowels are to be relieved, a bed-pan, if the patient is at all exhausted, should be invariably employed, or what is better, a folded sheet placed beneath the patient, into which he should be encouraged to relieve himself without restraint, whenever the inclination is at all felt ; for by restraining the relief of the bowels but for a moment, vomiting is induced. In a rainy or damp state of the atmosphere, a stove or fire, or red-hot bricks, as a means of drying the air of the apartment, I strongly advise. When the case, as

in simple diarrhœa, is not of this urgent description, a commode or night-chair should be used by the patient, close to the bed-side. In this disease the powers of the system cannot be too scrupulously husbanded in every possible way; I have known several patients lose their lives, from want of attention to this injunction, by getting up to relieve the bowels, and I remember one dying in my presence, who appeared to be doing well, from simply sitting up in bed to take a little broth; so that, whatever is given to the patient, should be given while he continues in the recumbent posture; and the evacuations should be received at all times in a basin or towel.

**Particular Treatment.**—The next thing after the patient is in bed, is to determine whether it is proper, or not, to bleed. It may not in all cases be indispensable, but its timely employment, not only assists the operation of other remedies, but is so directly curative in its character—warding off inflammation and spasm, and having a tendency to avert so many evils which may arise, that, except there exists some circumstance positively prohibiting its employment, as a general remedy during the epidemic prevalence, or severe form of the disease, I am of opinion it should be adopted, provided it be practised with the *precautions* I have before pointed out under the head of bleeding. Should there be pain in the region of the stomach and liver, and especially if that pain be increased by pressure over the part,

or be attended with frequent vomiting, and great desire for cold water, or the breathing be oppressed, or the head painful, or severe spasms exist,—the patient without a moment's hesitation should be bled, and to as great an extent, regarding the precautions I have referred to, as the pulse or other circumstances of the case will admit of:—and the bleeding, where there is a feeling of much oppression, and especially if the pulse be at all tense, may be repeated several times, in small quantity at a time, during the progress of the case with great benefit, if the precautions pointed out be duly observed. I have proved this in many instances, adding, by way of commentary on this and some other points of practice, a case in illustration, particularly inviting the reader's attention to it, as detailed in the Supplement.

**Treatment of the Ordinary Form of the Disease, as it occurs in European climates, and sporadically in India.**—The next thing to be done, after the bleeding, if this be thought advisable, or whether bleeding be resorted to, or not, is giving the emetic pills in the way I have pointed out (under the head of *Emetics*,) one every half-hour, (chewing it if at all hard or if they have been long made), and after they have operated once or twice as an emetic, if amendment has taken place, continuing them every hour, or at such intervals—short of their producing an emetic effect—when they will operate on the skin and induce perspira-

tion ; and continuing them after this, as the pulse improves in strength and amendment takes place, every two or three hours till bilious evacuations are occasioned, and urine (the secretion of which is also suppressed in this disease), is freely excreted,—and when this is the case, the disease may be considered terminated, though it is proper to continue the pills at longer intervals till the evacuations are of a healthy appearance ; when this is the case, follow it up with a decoction of bark, in doses of a wine-glassful four times a-day ; or the sulphate of quinine, in doses of a grain, may be taken as frequently, as a febrifuge and tonic, till the patient's health and strength are established. If amendment does not ensue from the emetic operation of the pills, the treatment to be pursued must be as in the severest form of the disease, to be next described.

**Severest form of Congestive, or Asiatic Cholera.**—But if amendment does not succeed to the emetic influence of the pills, which should be taken in this case also, as recommended in the milder or ordinary form of the disease beforementioned, the next thing to be done is,—to apply a mustard plaster to the whole region of the stomach and bowels. For this purpose mustard, as it is usually prepared for the table, but a little more fluid, should be spread thickly on a napkin, and, after being applied, should be retained on the part for fifteen or twenty minutes, and the same may be repeated an hour afterwards : and should spasms



become at any time severe, a plaster of the same description may be applied to the spine or backbone, along its whole length, or to the lower extremities. The spasms are however, I believe, only another modification of the vomiting influence, developed by irritation of the spinal marrow, and are best treated by keeping the bowels free by the agency of saline clysters, which, as I before said, should be now commenced, conjointly with the calomel, and immediately after the whole of the emetic pills have been taken. The calomel, that it may be diffused over the stomach's surface, should be given in powder—putting it on the tongue, and, if it be mixed with a small pinch of salt, which will occasion a flow of saliva into the mouth, and then gargled about the mouth before it is swallowed, its absorption by the stomach and its influence will be facilitated. The dose must be proportionate to the emergency of the case, from two grains to twenty every hour.\* In common, twelve grains may be

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\* The indications for a remedy being understood, it is not the quantity, but the effect induced, which should govern us in its administration. And I may truly assert that, with the commonest precaution, nothing is to be feared; at least, I have never seen an instance of any mischief occurring from the large doses of calomel I have thought it necessary to prescribe. Salivation does occasionally occur, but it may be always avoided by simply attending to the pulse, which becomes excited under its influence; or to the appearance of the evacuations, for it invariably first acts upon the biliary organs, and when this is

first administered, but in severe cases twenty should be given, and followed up with the same, or proportionately less doses, till warmth and amendment take place; using, as before noticed, the saline clysters between each dose, or oftener if vomiting, spasms, or oppression be complained of;—and practising bleeding also in relief of these symptoms with the precautions given, if the pulse appear to justify its adoption. The calomel is here given as a stimulant, concurrently with which, therefore, as an occasional cordial, a table spoonful or two, but not more at a time, of brandy and water (warm or cold as most acceptable to the patient), in the proportion of one part of the former to three of the latter, may be administered, provided it is agreeable to the feelings of the patient, but not otherwise. If, on the contrary, he express a preference for cold water, which is generally the case as the disease progresses, let this alone be given—Nature's indications command at all times our most respectful

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observed, it should be given in much less quantity, and in conjunction, for the most part, as I have advised, with an aperient. It is further satisfactory to know that, when it has salivated, the patient has almost invariably been secured from the after consequences of cholera, fever, gastro-enteritis, and dysentery, which so constantly succeed to the protracted cases of the disease, on account of the more permanent congestions which ensue; and it may, therefore, become a question whether we act rightly in stopping short of producing this effect in any such protracted case.

attention, taking care withal that the stomach be not oppressed by quantity—a wine glassful, therefore, is as much as should be allowed at any time, and only half of this in common ; but this may be given every quarter or half hour, if demanded by the patient. In addition to these means, if there be much coldness of the skin, and depression of the circulation, the extremities and surface of the body generally should be continuously rubbed by the warm hand of an attendant, or with hot flannels besprinkled with a strong brine of salt and water. And in cases where the evacuations have been considerable, or the patient reduced by previous exhaustion, an injection of half a pint of warm gruel, sago, or the like, with two or three table spoonsful of brandy in it, may be very advantageously substituted for the saline clysters, every half-hour. See what has been said on the subject of nutritive injections in the former Chapter. The use of the punkah or fan is another advisable measure, and is often much coveted by the patient, and should be employed accordingly, and the patient's feelings consulted on all occasions as far as may be. As amendment is generally followed by febrile heat or excitement, when this takes place, the clysters may be omitted, and a solution of Epsom salts, a tea-spoonful in a quarter of a pint of water, may be taken as a substitute, between each dose of the calomel, and the treatment followed up as in the former instance, and should in all other cases be with the quinine till health is restored.

**Mildest Species, or Diarrhœa.**—And next let us consider that still milder form of affection, partaking of the character more of simple diarrhœa, or looseness of the bowels, than of cholera, and which is attributable, I believe, more to suppression from cold of the perspirable or cutaneous secretion, than to any other cause; the evacuations being less limpid, and more coloured in character, marking a much less amount of disease. The indications in this case, bear reference more especially to the restoration of the perspirable secretion, but excitement must at the same time be imparted to the liver, which is also torpid and oppressed, as a consequence not unfrequently of the preceding heat of season, or if not, it is often so rendered by cold; purposes, which are best fulfilled, by adding to the pills of calomel and emetic tartar, a small quantity of opium, as it exists in the compound called “Dover’s powder,” ten grains of which contain one grain of opium. The following pills will combine all these remedies, in proportions which I believe most suitable for general administration in such cases. Calomel twelve grains, emetic tartar two grains, Dover’s powder twenty grains, made into twelve pills with conserve of roses. The quantity in each pill consists therefore of one grain of calomel, with a sixth part of a grain of emetic tartar, and the same quantity of opium. Two of these pills should be given at first, and one every half-hour after till full vomiting is induced; after which, one may be taken every two or three hours, till

bilious evacuations and free perspiration take place; at this longer interval they will not occasion vomiting, although a little nausea may be induced. A tumbler of warm water may be given, when vomiting takes place, in aid of the emetic, but after its operation, an occasional small quantity of barley water or wine-*whey* will be all that is required till bilious evacuations are occasioned, when some mild nourishment, as sago, tapioca, thin broth, or other light description of food may be afforded, continuing at the same time the pills at longer intervals, every four or six hours, till the evacuations become of a bright orange colour, when they may be omitted.

**Dysenteric Form.**—The attack of cholera has, however, in some particular instances been preceded by dysentery, or a purging of some day's continuance, of scanty, bloody muculent evacuations, attended with straining, and pain across the navel, extending not unfrequently to the anus, attended also, occasionally, with alternations of heat and chills, or symptoms of obscure febrile commotion. The only difference that exists between this and the foregoing species is, in the localization of the congestive fulness of the vessels—this implicating those of the large intestines more particularly, and the former the vessels of the small bowels. The treatment of the choleric attack is precisely the same as in ordinary cases of the disease, but of the premonitory stage or dysentery, see the next Chapter.

**Cholera Morbus.**—The affection of the stomach and bowels I have here in view, is that characterized by vomiting and purging of a green or yellow fluid—bile, attacking the intemperate, not unfrequently after a debauch, or exposure to cold, as well as some other persons after hot weather ; and is often attended with severe spasms and exhaustion. This is a disorder more particularly of the liver than of the bowels, evincing preternatural excitement of this organ. A condition frequently developed by irritation, which previously exists in the duodenum, or that portion of the bowels into which the gall or biliary duct opens ; through the medium of which duct, irritation (the result of intemperate habits, or otherwise induced by indigestion, or some acrid excitant of the part, or as an effect of cold), is extended by continuity to the liver, and which organ, being previously in a state of congestion, is thus excited to increased secretion, and hence the bilious evacuations. This is, therefore, a case of irritation, or exalted action of the liver ; and when not dependent upon some indiscretion of diet or temporary cause of excitement, borders upon, and develops not unfrequently, inflammation of this organ, and, as such, I have often seen it terminate in abscess.

**Treatment.**—The quantity of green bilious fluid ejected by the stomach and evacuated by the bowels in a case of this kind is sometimes very great, and the irritation and exhaustion consequent

thereon are often extreme. The true character of the disease must, however, be steadily held in view, as one highly congestive of the liver, and not unfrequently associated with, or succeeded by, inflammation of that organ. Bleeding is, therefore, obviously indicated; but when the exhaustion is considerable, this must necessarily be cautiously practised, the patient being at the time in the recumbent posture, and the quantity of blood taken limited by its effects upon the pulse, withdrawing it from a small orifice, and repeating the bleeding afterwards every two or three hours as excitement becomes developed, or as circumstances render necessary. The bilious evacuations, which I believe to be curative efforts of the system, in relief of the oppressed organ, however proper it may be to moderate, should not, therefore, be hastily suppressed. The operation of calomel being modified by the extent of the dose, a large one is here indicated—twenty grains may often be given with advantage, combining it with a grain of opium; and a fourth or sixth part of this quantity, with half a grain of opium, repeated every two or three hours afterwards. A large mustard plaster should at the same time be laid over the whole region of the stomach and liver, and be kept there for fifteen or twenty minutes. And, upon the principle of derivation, advantage will be afforded by immersion of the feet and legs in a pail of hot water, in which a couple of ounces or more of flour of mustard has been diffused;

or, in severe cases, immersion of the whole body in a bath of the same description may be very advantageously practised. The vomiting, if considerable, is best allayed by the occasional administration of a large clyster of thin gruel, in which a tea-spoonful of salt has been dissolved; or, half a drachm of calcined magnesia in a small wine-glassful of water may be given between the doses of the pills; or an effervescing saline draught or soda-water may be allowed, with the same intention. The vomiting and more urgent symptoms being by these means allayed, the liver should now be more particularly examined; and should there be pain or tenderness experienced on pressure, a dozen or twenty leeches should be applied, and when they have done bleeding, a large blister should succeed them; the leeches, if necessary to repeat, being afterwards applied to the anus, and the pills continued every four or six hours, till gentle salivation is induced.

But, in the milder form of the affection, arising from some temporary cause of irritation, two grains of calomel with half a grain of opium, taken in a pill every three or four hours, will soon relieve the symptoms, whether they be of vomiting, or purging of bile, or both; this followed twelve hours after, or when the evacuations become yellow, with a dose of castor oil or rhubarb, will be all that is really required.

**Important Practical Reflections.**—It remains for me to observe, most emphatically, before speaking of the second stage or sequelæ of the



attack of cholera, that a patient and steady application of the means pointed out, directed by the principles unfolded, (which should be clearly understood, for unless principle directs the hand no disease can be treated as it ought to be), according to the existing symptoms and severity of the attack, with all proper confidence in the means, and without wavering or precipitation, will in general prove successful ; and I believe invariably so, if they are resorted to sufficiently early, that is, before the congestive accumulation of blood in the vessels of the stomach and bowels has become so considerable as to intercept, wholly or nearly so, by these channels, the absorption of our remedies ! To this circumstance, that is, the non-absorption of our remedies, it is owing, I repeat, that the disease has proved so fatal.\* Its fatality in general not being

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\* Up to a certain period, absorption takes place, as is evident by the effects of remedies, opium in particular, which being given in solution as laudanum, (which has been but too commonly the case), takes a certain amount of effect—while the twenty grains of calomel, which may have been simultaneously administered, produces no effect whatever : the one being a fluid and coming in contact with a large surface of the stomach being absorbed, and the other, comparatively an insoluble substance, remaining unabsorbed. A solution of mercury would therefore appear to be a very desirable remedy ! and as such, I should strongly advise for trial, in severe cases of the affection, a solution of the bichloride of mercury—two grains rendered soluble by twenty of the hydrochlorate of ammonia, in two ounces of water. The eighth part of a grain, or a tea-spoonful of the solution, being given in two

attributable, I believe, to any want of appropriate remedies; though doubtless the virulence of the poisonous cause, in some instances of its epidemic visitation, may, by its intensity, have destroyed life before the system has had time to accommodate itself, or bring about those local congestions of the stomach and bowels and evacuations which Nature resorts to for its relief.

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*In concluding this Chapter, I have to request that my reader will now refer to the cases in the Supplement, adduced in illustration of the application of remedies.*

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table spoonful of water, every half-hour, continuing the calomel at the same time, and omitting the solution of the former when the pulse improves, and as excitement becomes developed. But this is a suggestion I make for adoption by the profession, as well as the administration of the above solution by injection into the bowels, a teaspoonful (or two) in half a pint of thin gruel or broth, which I should very strongly advise when the pulse is very feeble and stomach irritable. Of its utility as a local application the second case in the supplement is offered in illustration.

## CHAP. IV.

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*The Second Stage of Cholera,  
And of Fever and Dysentery in general.*

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**The Second Stage of Cholera, and of the Fever which succeeds it.**—If the case of cholera be a protracted one, which will seldom occur except there has been neglect of the proper measures in the beginning, the symptoms more particularly characterizing cholera—or those of watery purging, with general inertia, cold, and depression of the circulation—will be followed by those of gastro-enteritis, or, in plain terms, inflammation of the stomach and bowels; which will be denoted by pain and sense of heat in the stomach, an insatiable desire for cold water, and an extremely irritable state of the stomach, every thing that is swallowed being in general rejected; and if the patient live sufficiently long, vomiting of a green bilious fluid sooner or later takes place. These latter symptoms will be attended with fever, and, in Europe frequently, of the typhoidal, or low remittent character. The fever in the severest form of affection, or rather the reaction, which ensues in ill treated or neglected cases, is in general, however, but very imperfectly developed, appearing centralized and

confined to the inflamed organs, the region of the stomach and bowels feeling exceedingly hot, while the extremities are as proportionately cold to the touch;—a state characterizing, but too conspicuously, the great impairment of the function of the skin or lungs. These symptoms in general are attended with great restlessness, and associated sometimes with spasms or delirium. As bile or urine—the precursors of amendment in all cases—seldom becomes secreted in these, they very generally prove fatal.

**Explanation of the Phenomena of Inflammation, and Fever in general.**—The character of the aforesaid symptoms should be clearly understood: they consist of a sub-acute inflammation of the mucous membrane of the congested bowels, developed by the stagnant blood in the veins of the part, retarding the blood in its passage from the arteries, and thereby distending the latter, and exciting them into inflammation. This inflammation of the bowels implicates the lining membrane of the stomach also, and extends, if the patient live long enough, by means of the biliary duct, which opens into the bowels, to the liver also—to the extent, at least, of producing irritation, and the excitement of increased secretion of the bilious fluid: and the fever, which attends it, is developed in the same manner, that is, by the congestion of the venous system in general, retarding the blood in its passage from the capillary

arteries, and exciting them, by reason of their distention, to irritation, or a condition of increased action—but short of that which exists in inflammation; and which, as constituting fever, will take place, or not, as there may be power sufficient in the system, or the blood possess the requisite amount of oxygen and excitable qualities for the purpose, as adverted to in the previous section, with respect to the function of the skin and lungs.

**Treatment of Inflammation of the Stomach and Bowels, and Fever succeeding to Cholera.**—The indications in these cases are, accordingly, bleeding, in relief of the inflammatory congestions, to the extent the pulse will justify—the pulse, after a few ounces of blood have been taken, generally improving under the operation—and repeating it at short intervals; or the application of a dozen or twenty leeches on the pit of the stomach, if the former is not to be accomplished; and after this, a cloth several times folded wrung out in warm water, should be applied over the whole extent of the bowels, covering this with a flannel, to prevent cold, and renewing the moisture occasionally, as the cloth becomes heated or dry; and at a later period, after leeches have been applied once, or oftener, and the heat of the part has subsided, a blister should be substituted, and kept open. If coma or delirium be present, a dozen leeches, also, should be applied to the temples, and a cold wet napkin constantly to the head. In addition to these mea-

tures, if the irritability of the stomach is great, a clyster of warm gruel, in which a large teaspoonful of epsom salts has been dissolved, should be injected every two hours; and if bilious vomiting exists, a weak solution of epsom salts, half a teaspoonful in a small wine-glassful of water, to which half a teaspoonful of magnesia may be added, should be taken every hour or two; or, if the vomiting is without bile, a scruple of calomel in powder should be given, followed by a soft pill of calomel, three grains with one-third of a grain of opium, every two hours, instead of the magnesia and salts, and a few spoonful of cold water. If there be much depression, a scruple of calomel may be continued in substitution of the pills, with an occasional nutritive injection, till bile is plentifully excreted by the bowels, when the intervals between the doses may be prolonged to every four hours, and a small teaspoonful of epsom salts given two hours after, or between the pills, and these continued till the secretions from the bowels are healthy in character. Or, if the case has been protracted, the pills should be continued till gentle salivation is induced, in hope of averting an abraded, or more or less ulcerated state of the bowels, which frequently succeeds to the inflammation present in these cases, when there will be still pain, although felt, perhaps, only upon external pressure, with a low and obscure form of fever of the remittent type—periods of exacerbation and remission—once or twice in the twenty-four

hours, if the case be carefully watched, and not unfrequently delirious wandering is found to attend it. The blister, which I before recommended to be applied, it is advisable therefore to keep open, in hope of averting this ulcerated condition ; or its application, if necessary, should be now renewed. The calomel being now omitted, a decoction of bark, or the quinine should be substituted. Half a pint of strong decoction of cinchona bark, in which two drachms of epsom salts may be dissolved, should be taken in doses of a fourth part, every two hours. Or if the fever be more conspicuously apparent, and the bowels relaxed, the following mixture is preferable :—Sulphate of quinine, twelve grains, Dover's powder, twenty grains, dissolved in one drachm of diluted acetic acid, and six ounces of liquor of acetate of ammonia ; a table-spoonful, or twelfth part, to be taken in a wine-glassful of water, every two or three hours. It will in general be found to keep the skin perspirable, and the bowels sufficiently open ; if not, an occasional dose of castor oil may be necessary. The diet, during the period, should be nutritious, but of the blandest description, consisting of sago, tapioca, chicken broth, rice boiled till it is quite soft, with butter, milk, jelly, and light puddings ; and a spoonful or two of wine with water may be given occasionally, if there be much exhaustion ; and an opiate, if necessary, to secure the night's repose. The tepid shower bath, in the morning, may also be a useful auxiliary. In

furtherance of the recovery, I cannot, however, too strongly recommend a change of air as soon as it is possible to remove the patient, and a very cautious return to more solid sustenance.

**Of Remittent Fever and Dysentery, their Symptoms and Connexion.**—In continuation of the foregoing section, and in exhibition of the connexion that subsists between cholera, fever and dysentery, I must add the notice of a variety of the affection, which was, in the month of August, 1830, exceedingly prevalent at Warsaw, where fever and dysentery, annually at the same season, are, I was informed, extremely common. The following offers an account of its insidious mode of attack, which accords very much with the usual mode of invasion of remittent fever in general. A sense of fulness about the region of the stomach and liver, and of languor and incapacity to exertion, mental and bodily; occasionally with giddiness or headache, the latter, however, was often attended with an obscure form of fever, evinced by heat of skin, thirst, and an excited state of the mind, experienced at some particular hour of the day, and terminating by more or less dampness of the skin and moisture on the forehead. A slimy coated, white, or furred tongue, or otherwise an unusually clean, pallid, or red tongue; lips pallid, or of leaden hue; eyes often of a pearly appearance, and surrounded with a brown circle; the countenance sallow; appetite indifferent, and the digestion in general imperfect,



evinced by flatulence, and distention after a meal. Bowels at first constipated, succeeded, however, frequently, by relaxation, attended with pain and an obscure form of inflammation, and terminating, not unfrequently, in bloody muculent evacuations, accompanied with pain across the navel, and straining, or in other words, in dysentery.

**Cholera in connection with Dysentery and Fever.**—The preceding symptoms, fluctuating with the weather, and contingent circumstances, continued sometimes two or three weeks; the individual feeling that he was unwell, but not attaching any great importance to his condition, till the dysenteric symptoms came on, or the depressing influence of the atmosphere, preceding or accompanying wet weather, or an attack of indigestion, following the use of some improper article of diet—as potatoes, cabbage, sallad, or the like; or drinking too freely of some cold fluid, or wine; or fatigue, or exposure to the sun, or cold—developed an attack of cholera; shewing itself by watery purging, or vomiting, succeeded by cramps in the legs, lividity of countenance, cold clammy skin, and feeble pulse,—from which attack, if the patient recovered, (the treatment of the choleric symptoms being in these instances the same as in ordinary cases), that was invariably succeeded by fever, more conspicuously in character of the intermitting or remitting type—occurring daily, as evinced by the augmented temperature of the skin and frequency of the pulse,

though generally unpreceded by any very marked cold stage, further, than a sense of shuddering, tremor, or quivering of the lip, chilliness in the back, and depression of the circulation ; though in some cases the prominence of these symptoms extended to shivering and chattering of the teeth. An attack of this kind, it must be obvious, coming on as detailed in the beginning, with or without the symptoms of dysentery, or the attack of cholera, is nothing more than one of fever,—based upon torpor of function and congestion of the liver and associated organs ; and attributable to the continued respiration of an impure atmosphere, of a less virulent character than ordinarily gives rise to cholera, such as resulted from the imperfect ventilation of the town, and foul state of the drains, combined with heat of weather ; or it affects persons otherwise circumstanced exposed to some swamp or filth in the neighbourhood of their abode, or damp of forest through which they may have travelled. If fever and cholera both take place from the same cause—malaria, it may be asked, what constitutes their difference ? In reply, I would say—in the operation of that cause ; its amount, virulence, and intensity, as aided by concurrent circumstances ! Thus we see, fever with dysenteric symptoms, as above related, lapsing—by the accessory agency or augmentation of depressing cause—as a humid state of the atmosphere, an attack of indigestion or the like—into cholera. The condition of system in the latter

case, being that in reality of the cold stage of fever in augmented degree. The native energies of the system being too much prostrated by the extent of the cause to bring about the reaction of the febrile condition ; and hence the fact—that in the process of successful treatment, as amendment takes place, febrile action is developed.\*

**Of Remittent Fever in general.**—The disease above noticed is in reality nothing more than the ordinary form of remittent or malarial fever of

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\* I would here repeat what I have elsewhere said, that I in no wise mean to imply that malaria is absolutely indispensable in any case to the production of the disease, though in general, I believe it to be—primarily operating, or secondarily as a debilitating agent—one of the most frequent and prominent causes of cholera. The epidemic visitation of the disease at Kurratchee was, in my opinion, quite or nearly independent of malaria. The depressing influence of an extremely humid state of the atmosphere, following long continued hot and very dry weather, I have no question was the immediate cause of the disease in this instance—the debility of system, and associated congestive fulness of the liver and bowels, succeeding to long continued hot weather, determining the attack of those affected, under the suddenly altered and extremely debilitating influence of the first-mentioned cause. But, in ordinary circumstances, the disease occurs under the united influence of heat and malaria, followed by the conspiring one of cold, or other concomitant circumstance—diarrhoea being its mildest and more prevalent form. Dysentery is another variety, and the congestive typhus of Armstrong another—the latter being intrinsically the same disease modified by climate, and form, in which, perhaps, in its severest degree, it more frequently manifests itself in this country !

tropical climates, but to which it is by no means peculiar, it being the disease to which travellers are exposed during the summer months in the Italian states, the islands and shores of the Mediterranean, the banks of the Rhine (as I know by personal experience), and as prevalent in France, Spain, Portugal, and during the autumnal months in England; and which malarial fever, when attended with bilious vomiting, or pain in the side or head, is often called bilious fever; and which, moreover, under particular circumstances, gives occasion not only to inflammation of the stomach and bowels, or symptoms of gastro-enteritis and dysentery, but also under other circumstances or states of the system, to other local inflammations of the membranous structures,—such as of the joints, the knee, wrist, or other, occasioning pain and swelling of the part, and thus developing rheumatic fever; or of the membranes of the brain, thus constituting brain fever; or as I have often known in India, the same cause affecting the membranous coats of the eye, and occasioning muco-purulent ophthalmia, or the inflammation of the eye common to Egypt; or the malarial cause may give rise to a condition of *irritation*, or a less perfectly developed form of inflammation, of the membranes of the brain, or spinal marrow, or sheaths of the nerves, and occasion thus all the varieties of neuralgia (or nervous pain) and spasmodic attack, as sciatica, tic-doloureux, epilepsy, &c.

**Principles of Treatment.**—Upon the subject

of malarial fever in all its varieties, I can speak with great confidence. India is the place to study the subject, where these diseases prevail in their enlarged and more conspicuous forms ; and where, having held charge of the garrison of Seringapatam, for a period of four years, where malarial fever is endemial all the year round, and exists in all its varieties—from the simplest form of ague to the severest species of yellow fever, I have had abundant opportunities of studying it, and ample experience in the treatment of all its forms. With respect to which experience, as embodying the principles of treatment applicable to every form and variety of the affection, (requiring alone some slight modification in the detail), I shall here succinctly state it to consist—in the restoration of the secretions of the liver and skin as far as may be, to their healthy condition—by the agency of calomel and a few subordinate remedies ; relieving, at the same time, any organ that may appear by pain more particularly oppressed or congested with blood, or excited by inflammation, which the preceding condition may have developed—by bleeding, locally as by the application of leeches, or generally by the lancet ; following the relief of these symptoms up immediately after by the exhibition of the cinchona bark, or quinine, in supercession of the febrile cause. This is the sum and substance of the treatment of malarial fever—whatever shape it may assume, and which I trust, I have robbed, or even-

tually shall do, of its protei-form disguise, which I may briefly add, results from the varied circumstances (of season, constitution, &c.) predisposing and exciting, under which the individual may have been exposed to malarial disease; and with reference to which, I would direct my reader's attention to the advice given on these subjects with respect to cholera, in the thirty-seventh page, as being equally applicable to the production and prevention of fever.

I must now return to the subject from which I have so long digressed, of remittent fever, succeeding to the attack of cholera, or accompanying the dysenteric symptoms, which preceded the cholera, the treatment of which is the same precisely as that given in the preceding section—of the fever following the symptoms of gastro-enteritis.

*To put my reader in possession of a full measure of instruction, and clear comprehension of the subject—that he may be able to treat the disease in all its varieties, I shall now introduce and explain to him, the progress of an attack of intermittent fever or ague—the primary or initial type, or simplest form of this genus of fevers, as it attacks a person previously in health, exhibiting it therefore in its integral character—free, that is to say, from any disturbing or complicating association.*

**Intermittent Fever, or Ague**—the initial type, or simplest form of malarial fever. This will often follow a single night's repose in, or an

hours' drive through a jungle, or marsh, or other malarious locality (see *Malaria*, in the 1st Chapter.) It may occur on the morrow, or it may be some days, or many weeks, before the attack of fever becomes developed; the cause, we may presume, in the latter cases, being less potent, requiring the accessory agency, or united influence of other depreciating causes upon the system to effect the result, and hence the disease, in these protracted cases, is seldom of the open simple form of ague, but more frequently of some obscure and complicated form of remittent fever, or, perhaps, some remittent nervous or neuralgic affection, as *tic-doloureux*, *sciatica*, *rheumatism*, or even tooth-ache—the irritation of a bad tooth determining the locality of the affection.

**Symptoms and Treatment.**—Returning to intermittent fever, the attack is evinced by a feeling of cold, first felt in the back, attended by yawning, which, gradually augmenting, extends to severe shivering and chattering of the teeth, continuing for an hour or two, or a longer duration; this is succeeded by progressive heat of skin, throbbing of the temples, and excited pulse, or the condition of fever; which, lasting three, four, or more hours, subsides by degrees, terminating in profuse perspiration, leaving the patient, if previously in health, weakened by the process, but without pain or otherwise materially deranged, till the paroxysm of fever recurs, which comes on in like manner after an

interval of 24, 48, or 72 hours, dependent upon the extent of the cause and other circumstances, provided, that is to say, the proper means have not been pursued to prevent it ; which are, soon after the perspiration of the first attack has well set in, if there be neither sickness of stomach, constipation of bowels, much pain in the head, or oppression of breathing, to commence and continue to take (the patient remaining in bed, and encouraging the perspiration in a moderate degree) in a table-spoonful of wine two grains of sulphate of quinine every two hours, with a cup of beef tea, wine-whey, or sago between each dose, till six doses have been taken, when the quinine may be repeated every three or four hours, and more substantial nourishment be allowed between the doses of this remedy, which may be now gradually omitted.

But, should the disease recur, which will be the case if the time has not admitted of the blood becoming sufficiently impregnated with the quinine, (which operates, I believe, as an antagonist principle, in supercession of the malarial or poisonous cause\* which gives occasion to the fever), I should

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\* Experience has proved to me that malaria, having taken possession of the blood, and given rise to intermittent fever, adheres to it with a pertinacity that will not readily yield to the ordinary means of purifying the blood ; we may, therefore, conclude that none of the secretive organs have any direct power of eliminating and divesting the blood of this aerial poison, in common with some other poisonous agents of the same class. Hence



advise, on the first symptom of its approach, or that of a feeling of cold and depression, that the quinine be omitted, and immediate attention paid to the secretive organs, which, if not previously, necessarily became now, or soon after, deranged, by the debility succeeding to the excitement of fever and the congestive accumulations which ensue; the latter, when the attacks are frequent, often enlarging the spleen, and hence the tumour in the side called ague-cake.

With this view, I should recommend that an emetic be now immediately taken—two grains of emetic-tartar dissolved in three spoonsful of hot water, and as soon after its operation as the stomach will tolerate it, three grains of calomel in a soft pill, followed, during the heat of fever, with a teaspoonful of epsom salts dissolved in half a tumbler-ful of cold water, and repeated every two hours till the

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we find fever and hydrophobia occurring often many weeks after the blood's impregnation with the virus, or, if I may be allowed the expression, after the seeds of the disease are sown. I have reason, however, to believe that this aerial poison might be eliminated by the cutaneous surface, seeing that Nature, with her usual benignity, appears, by the perspiration which succeeds the attack of unsophisticated intermittent fever, to point out to us this as the remedy; and I would therefore most strongly advise the suggestion being carried into effect, and that the stage of perspiration should be maintained for a couple of days, or longer, by antimonials and wine-whey, the patient being, at the same time, supported under its influence by beef tea and other suitable nourishment: addressing myself now to the profession.

bowels have been effectually relieved ; and after this has been effected, and a bason of broth or other nourishment has been taken by the patient, that the quinine be again administered, as previously advised, and which should be continued, without intermission, in anticipation and prevention of any future attack, which will now most probably be prevented ; but if not, the same plan must be persevered in as in the first instance, to the extent, at least, of giving the emetic on the earliest symptom of the approach of the cold stage, which it will be found materially to abridge and beneficially operate in preventing the spleen's enlargement. Should, however, pain in the head and intolerance of light exist, or pain in either side, or the stomach, or oppression of breathing be coincident, the patient should be first bled, to the relief of these symptoms, before taking the emetic, or the bleeding may be practised during the heat of fever ; the calomel and salts in these cases should be given also ; and when the bowels are relieved, if the evacuations are green, or dark and unhealthy, the calomel should be repeated every four hours till they become healthy, and the quinine be administered after this.

**Remittent Fever, its especial Character.**

—The treatment of intermittent fever, above detailed, embodies the principles of treatment in all forms of the disease. The symptoms, however, above enumerated, when allowed to progress, augment in number, and the case lapses into one of

remittent fever, the symptoms progressively becoming complicated and obscure in proportion to the frequency of the attack, the extent of the congestive accumulations of blood in the vessels of the liver, spleen, and bowels, or head, and of the debility which ensues ;—the congestions, or stagnant accumulations of blood in the organs, developing, first, irritation, and then inflammation of the organ affected, and symptomatic fever—and this, engaging the periods of intermission, converting an intermittent into a remittent form of fever—a compound, in short, of intermittent fever with the fever of irritation, or one with definite periods of exacerbation or increase, but without perfect intermission at any time. In like manner, idiopathic remittent fever is occasioned, by the concurrent derangements of the system, or disorder of the stomach, bowels, and liver more particularly, which exist previous to, or are associated with, the influence of the malarial agency, or more particularly febrile cause ; the fever consequent upon these several derangements of the system obscuring and modifying the malarial influence, or fever to which this gives rise, the compound producing, proportionately to the amount of either, or character of the obscuring cause or causes, all the varieties of the disease I have named. In exemplification of the subject, and of the operation of cold as a deranging cause, and one of fever, I shall adduce a little experiment I made in illustration a few evenings ago. Putting my feet and legs for ten

minutes into a pail of cold water, they became at the end of that time very cold, and I felt a sense of chill pervade my back ; on this occurring I went to bed, my feet soon after became hot and glowing, and my skin, eventually, generally preter-naturally heated, and my feelings and pulse excited ; in short, fever ensued in consequence of cold. I now, in conformity with the dictates of nature and the thirst I felt, drank a tumblerful of cold water, and repeated the same an hour after, when the symptoms subsided, but I lost my night's sleep, and from this cause, and the derangements consequent on the retardation of the secretions of the skin and liver—as the ordinary effects of cold, I did not feel well for some days afterwards, not indeed until I had recourse to a pill of calomel and aloes, a grain and a half of each, in restoration of the secretions generally.

**Fever from Cold, with Inflammation of the Lungs, &c.**—The above example well illustrates the common one of catching cold ; now, had this occurred from general exposure to a cold and humid atmosphere, and to which my lungs, as well as my skin, must have necessarily been exposed, the direct effect of this cause upon the lungs, throat, and nasal passages exposed to its influence, would have probably developed, by retarding the blood's circulation in these parts—congestive fulness of their vessels, followed by *irritation* and excitement of these parts, (as in the case of the feet previously noticed), in addition to the general influence of cold

upon the skin, and excitement of fever which, too, would have probably ensued; and thus I should have been attacked with catarrh, sore-throat, cough, or perhaps inflammation of the lungs; or if, previous to the exposure to cold, congestive fulness of the blood vessels of the liver and bowels had existed—diarrhœa, or inflammation of the bowels might have supervened—symptoms, however, more frequently developed, from this cause, when applied to the lower extremities, as by getting wet feet. I exhibit these cases in illustration of the numerous modifying causes, which may, and do exist in malarial fever, in common with this other more frequent one of cold, which is known to every body; and which is treated by bleeding when required, with calomel, sudorifics, and other evacuants, and had recourse to with the view of restoring the secretions suppressed, and in relief of the febrile excitement, (which is continuous,) as will be hereafter detailed.

**Modifying circumstances in connexion with Malarial Fever, determining its especial character.**—And thus, if to the cause of intermittent fever—malarial impregnation of the blood, there be superadded, as an effect of heat—congestive fulness of the liver or bowels, and derangement of the associated organs; or the same symptoms as effects succeeding to cold, there will in either case be, more or less pain in the region of these organs, sickness of stomach, and inflammatory irritation evinced, modifying, in a greater

or less degree, the febrile attack ; or, if these symptoms exist in a preponderating proportion, they may obscure or mask the intermittent febrile one altogether ;—and thus, in proportion to the pre-disposing circumstances and constitutional disturbance which pre-exists, augmented in amount by the supervention of the malarial disease, a simple intermittent fever, or such as would ensue in a more healthy individual, is converted into a remittent, or a graver form of disease, with local inflammation and complexities daily augmenting in number, if the disease be not by timely means arrested : and thus are typhus and the graver forms of fever developed.

And now, with reference to the *pre-disposing circumstances* and character of the attendant symptoms ; in a man of intemperate habits, or another with congestive fulness of the liver and bowels, the excitement of fever succeeding to the malarial cause, will develop bilious vomiting, or inflammation of the liver, with pain in the side and difficulty of breathing ; or inflammation of the stomach and bowels, or dysentery ; or, in Europe, where cold is simultaneously in operation, and the lungs and air-passages in consequence exposed to affection, inflammation of the lungs, or bronchitis ; or the throat, as in scarlatina—will be more particularly affected, and thus will the fever be modified in character by the organ affected, and function it fulfils. The head, also, is frequently affected ; the brain,

especially in persons who suffer from care and anxiety, perturbation, or excess of mental employment, and not less so in young children, is very frequently affected ; and thus the pain or giddiness of congestion of the brain, or the delirium of excitement, which so frequently attends this form of fever. And again, as I have elsewhere said, in persons of a rheumatic or gouty tendency, swelling and inflammation of the joints, one or more, and often migrating from one to the other, as from the knee to the wrist, or elsewhere, ensue ; or, as I have known in India, and seen prominently in the garrison of Vellore, men going on duty as sentinels at night, and returning from guard in the morning, with their eyelids swollen and extremely painful, and the most inveterate form of muco-purulent ophthalmia follow as a consequence. And again, in this country, from some no less obscure agency, or modifying circumstance or condition of the blood, the malarial and developing cause of fever, we see affect the skin and throat at some seasons, developing scarlet fever ; and in other conditions of the system, or modifying circumstances, developing erysipelas. And I may mention also, women in child-bed, its developing fever, or otherwise modifying the character of the inflammation of the peritoneum, or uterus, which is apt to succeed. And to this catalogue of malarial fevers I might add many others,—malaria being the ordinary exciting cause, I believe, of influenza, modifying the usual effects

of cold, and developing this now too frequent affection.

**Typhus Fever, its Character and Treatment.**—And lastly, I may observe, to the development of the graver affection of typhus fever, we have only to look to the locality in which it is more frequently to be found, and the class of individuals more commonly the subjects of its attack, to discern that it is a disease made up of an assemblage of the afore-named elements, developed by cold, malaria, unwholesome diet, and deranged secretions, simultaneously or successively operating; one class of symptoms preponderating in one season, or under certain especial circumstances of its visitation—and another group in another, under different limitations; and thus, at one period, to be remedied by calomel, diaphoretics, and evacuants more particularly; and at another period by quinine and stimulants; or, under ordinary circumstances, by both timously employed. Its treatment, in general, should bear reference to the preponderating symptoms at the time being, bearing ever in view the leading feature or fact in the case—that the disease is essentially based upon debility! the excitement of organs or inflammation present, being not the cause, but the consequence of fever, and of general derangement,—a fact that must be ever borne in mind, and influence us in the whole class of malarial and remittent types of fever; and especially so with regard to blood-letting, which, in relief of



general fever and local inflammation, however properly it may be had recourse to at the early period of the disease, can seldom be practised with impunity at a later period ; leeches, followed by a blister, are therefore the more appropriate remedies in these cases.

**Practical Remarks, with Reference to Fever in general.**—I have now only to add a few observations with respect to dysentery, hepatitis, bilious fever, scarlatina, and erysipelas, that I may not be mistaken with respect to the treatment of these diseases, which are, that I am fully aware that these diseases may and do severally exist, quite free and independent in their character, or nearly so, of a malarious febrile origin. In the southern parts of India, the three former commonly prevail, as the effects simply, or more particularly, of heat of climate, which, as a debilitating agency upon the system, develops, as I have explained in the second chapter, when on the subject of the blood's circulation in the liver—congestive fulness of this and its associated organs—(and hence the frequency of diseases of the liver and bowels in hot climates and seasons), the head is often thus affected also; developing, under exposure to cold, by intemperate habits, or other cause of excitement, inflammation of the organs congested, and symptomatic fever;—the treatment of which is necessarily more active bleeding and evacuants, and calomel in restoration of the healthy secretions, and the latter remedy, general

experience testifies should be carried, in these cases of inflammation of the organs, to the extent of producing salivation.

This, then, being the ordinary character of these affections, and their successful treatment in the *southern* parts of India, has led the inexperienced to overlook the varieties I have pointed out, which he very well may, seeing the local affection in general so much preponderates, as to obscure or wholly mask its febrile concomitant; and which, being thus neglected, with almost moral certainty, determines the fate of the patient! That, in all such cases, where the amendment is not proportionate to the ordinary means pursued in relief of the symptoms of *hepatitis*, *cerebral affection*, or *dysentery*, and when, too, these several affections would appear to exist irrespective of any febrile malarious agency, I would most urgently advise a moment's pause, and great attention being paid, to the condition of the pulse, the temperature of the skin, and feelings of the patient at all hours of the day, as well as to the local affection, whether it be pain in the side of liver affection, or pain in the head of cerebral affection, or the straining with bloody muculent evacuations of dysentery—to discover whether there be a remission of fever or exacerbation of the symptoms of the local affection at particular periods: if so, the quinine is the remedy, and the patient will be saved! bearing in mind necessarily at the same time the local affec-

tion, conjoining with this view an occasional dose of calomel and opium at bed-time, with leeches to the anus, and a blister, in relief of these symptoms ; attending at the same time to the dictates of nature and desires of the patient, with reference to the nutriment afforded, which in none of these cases should be too lowering in character.

And with respect to *Brain Fever*, *Scarlatina*, *Erysipelas*, *Rheumatic Fever*, &c., in this country, the same remarks are equally applicable. I know full well that these diseases, or febrile affections attended with the same local symptoms, do in some seasons prevail independent, or nearly so, of a malarial cause, and require, therefore, a treatment more exclusively evacuant ; but I know equally well, on the other hand—founded on the exclusive doctrines of Clutterbuck, Broussais, and some other talented men, who inculcate that fever is, in all cases, the effect of inflammation, and not the cause—that great errors with respect to these subjects but too generally prevail, cases of the kind coming every day under my notice ; and with these impressions on my mind, I cannot too earnestly call upon the profession to consider all that I have said on the subject.

**The Treatment of Fever in all its forms.**  
—Viewing the several forms and descriptions of fever, before detailed, in the way that I have done, the treatment of all (and I believe I may, with truth, add, fever of every kind) is embraced in a

few general principles, definite in kind, though modified, doubtless, in degree, by the age, sex, constitution of the individual, and peculiar circumstances of the case, and consists in carrying out the two great leading indications I have pointed out, namely, relieving the more prominently congested, or inflamed organs of the abdomen, chest, or head, by blood-letting, and restoring, at the same time, the secretive functions of the liver, skin, and organs deranged, by calomel, antimony, and aperients ; following these measures up, as soon as such purposes have been fulfilled, by the exhibition of quinine, as a simple tonic, and in small doses, in one case, and in much larger quantities, as a febrifuge, in the other : the latter being an indispensable remedy in the large class of fevers of the remittent type, on which I am now more especially, though not exclusively, treating.

**Remedies.**—The above are the fundamental principles of treating every case of fever ; and now with respect to the remedies, and their particular application. At an early period of the disease, before the powers of the system have become too much prostrated by its continuance, if the pulse be at all firm, the skin continuously hot, and pain in any organ be experienced, or breathing be at all oppressed, general bleeding may very properly and advantageously be practised, taking from eight to twenty ounces of blood from the arm, dependent on the age, sex, and constitution of the individual (an

early and efficient bleeding often going far to at once arrest the disease, or, if not, operating to avert much after evil—the debility ensuing upon a continuance of the fever daily augmenting the congestions, and developing inflammation); or if the pulse and circumstances of the case will not justify general bleeding, a dozen to twenty leeches may be applied over the seat of the organ affected in substitution. And next, following up the bleeding with some pills composed of calomel and emetic-tartar, in the proportion of twelve grains of the former with two of the latter, made into twelve pills, with a particle of jelly or conserve of roses, and giving one every two, three, or four hours, according to the urgency of the case, till bilious evacuations, followed by free perspiration, is induced. And I should further recommend, if vomiting does not previously exist, that, before the pills are given in the way directed, two of them be given every half hour, till they first operate, which they will do, if so administered, as an emetic; and after they have thus freely acted, to continue them in the way previously advised. Emetics, however much out of fashion at the present day, I know by experience to be extremely valuable and harmless remedies, increasing the circulation through the liver, clearing the stomach, and fulfilling many other useful purposes in the treatment of disease. After the pills have been taken, as directed, in sufficient number to act upon the bowels, the evacuations at first are often

scanty, green, muculent, or spinach-like—the fore-runners of certain amendment, evincing how much the disease is connected with biliary engorgement and torpor, and of the liver's now return to duty—an effect which must be encouraged by a continuance of the pills with a seidlitz powder, or a small teaspoonful of epsom salts, between each dose; the intervals between the pills being now prolonged, as the appearance of the evacuations become yellow and more healthy. As soon as the latter effect takes place, both pills and salts may be omitted, and a grain of quinine be substituted, which should be repeated every two, three, or four hours, according to the emergency and circumstances of the case; having only to add, that if the fever be of the remittent kind, it must be given freely as a febrifuge, and in other cases simply as a tonic, to the extent only of two or three grains a day.

To these general instructions, I must now add some further particulars with respect to *the treatment of the symptoms of the local affection*, characterizing each particular variety of disease. Thus, in the more particularly inflammatory form of dysentery, marked by the severity of the straining, and the proportionate frequency and scantiness of the bloody, muculent evacuations: after general bleeding, which, at the commencement, should be carried to as great an extent as possible (the disease, if not early arrested, soon running into mortification), and repeated every six hours after, till the

symptoms are relieved ; or if the pulse will not justify this practice, a dozen or more leeches should be applied daily, or oftener, to the abdomen or anus, till these symptoms, which are decidedly of an inflammatory description, be completely relieved. And the pills aforesaid should be given, after their emetic operation has been fulfilled, with double the proportion of calomel, and in conjunction with a third of a grain of opium in each pill—that is to say, twenty-four grains of calomel, with four of opium, and two of emetic-tartar should be made into twelve pills, and one given every two hours, and continued till gentle salivation is induced. A poultice of bread and water should be also applied over the leech-bites, covering the whole of the abdomen, with a view of encouraging the bleeding, and to fulfil the purpose of continued fomentation. The treatment of inflammation of the liver, with which dysentery, when of this inflammatory species, is often combined, is precisely of the same character ; and the treatment of gastro-enteritis, or inflammation of the stomach and bowels, I have already detailed under the head of Fever succeeding to Cholera. And to these may be added, among the list of symptoms more particularly inflammatory, if the brain be affected, intolerance of light in addition to pain, a blood-shot appearance of the eye, sickness of stomach, and constipated bowels ; in which case, general bleeding may with propriety be practiced, in addition to a dozen or more leeches,

which should be afterwards applied behind the ears, or to the temples ; followed by the constant application of cold wet napkins to the head, and a blister between the shoulders, in addition to the general treatment, bearing reference to the condition of the secretions and character of the febrile affection. Upon head affections I have this other observation to add, that with respect to the irritability of temper and incoherence, which in fever cases often succeeds to too much mental employment, or exhibit themselves in those whose minds have been over excited by cares, anxieties, too ardent affections, or perturbations of any kind, these symptoms are best met by a moderate dose of laudanum, and the use of sedatives, after the secretions have been attended to, and leeches, if there be pain of head or giddiness, previously applied. Thirty or forty drops of laudanum on going to bed, followed up the next day with six or eight drops of the same, with each dose of the quinine, will afford the greatest possible relief, and avert a great amount of mischief.

I have now only to add, that the treatment previously detailed, is also the proper one of scarlet fever, bilious fever, and erysipelas, in short, no form of fever can occur but must come under this category, adding, however, by way of injunction, that season and circumstances will modify them in no inconsiderable degree, rendering the inflammatory symptoms on one occasion more conspicuously prominent, and on another, as may be generally



observed when the weather is lowering and the atmosphere damp, the opposite class, or those of depression more particularly to prevail; calling in one instance for the more active employment of depletive and evacuant measures, and in the other for quinine, stimulants, and support; the patient in all cases being under the influence of a poison externally derived, or internally engendered. In these observations I must add that, as in the above described eruptive affections, including that also of measles, and perhaps hooping-cough, as the affection of the skin clearly demonstrates, the existence of an acrimony in the blood, disposed thus to pass off by the skin, or in the latter affection operating as an irritant to the bronchial mucous membrane; we should, taking nature for our guide in all cases, encourage this relief by frequent sponging the surface with tepid water, or what is better, by the continued application of a large poultice to the abdomen or chest, or immersion in a bath, and the timely application of a blister in severe cases.

In rheumatic fever, purulent ophthalmia, and some other affections of the kind, the symptoms of pain and excitement of fever are more prominently intermittent in character, and denote, therefore, a treatment more nearly allied to that of intermittent fever, and accordingly, immediately after the operation of an emetic, followed by a calomel purgative and bleeding, if the state of the pulse require it, the quinine should be administered, as directed under the head of Intermittent Fever.

**Neuralgia, and Spasmodic Affections, their Treatment in general.**—And, finally, with respect to that large class of intermittent nervous, or neuralgic affections, whether of pain or spasm, *tic-doloureux*, *sciatica*, *epilepsy*, &c. &c.—the treatment of intermittent fever, of which they are often, I am of opinion, but imperfectly developed forms, is essentially the appropriate one, conjoined with leeching, blistering, or the application of other irritants, or in some cases sedative applications to the local affection; the use of the vapour, or on the contrary, cold bath, with attention to the secretions of the liver, the kidneys, and skin; and finally, the improvement of the general health by air and exercise.

**Concluding Observations.**—In concluding these observations on fever, I have only to add, and strongly to advise attention, in all cases, to the dictates of nature and the feelings of the patient; whenever a desire is felt for nourishment, cool air, cold water, or any particular article of diet, or beverage, let the same, whatever it may be, cautiously, that is in small quantity at a time, watching its effects,—be administered. Nature's dictates are often to be preferred to the doctor's prescription; I say this as the fruit of lengthened observation,—having in more instances than one, seen patients thus get well, by acting in direct opposition to the advice which, as a younger practitioner, at that time I have thought it expedient to give.



## SUPPLEMENT.

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### *The Cholera at Kurratchee, Sincde.*

[Extracted from the London "Medical Gazette."]

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"THE 86th regiment was encamped on the plain to leeward of the cantonment of Kurratchee, from April 16th to June 15th, 1846, when, in consequence of the occurrence of cholera, it was moved to the sea coast, four miles from the barracks. During the above period, the weather was exceedingly hot; even in April, in a large double-walled tent, the thermometer ranged as high as 104 deg. at mid-day; and during May and June, it continued to vary by day from 92 to 106 deg.; at night it generally fell to 80 or 81 deg., and the atmosphere being pretty dry, the dew point was 76 or 78 deg., or from 10 to 12 deg. below the temperature in the shade. The men did not suffer from any great increase of sickness during this period, but a general tendency to derangement of the stomach, liver, and bowels was evinced, by slight attacks of constipation, diarrhoea, and dyspepsia: this was attributable to the effects of sudden high temperature, after a long and fatiguing march in very cold weather. The prevailing winds had been N. W., but about the 5th of June, the wind changed to S. W., the direction of the monsoon; the weather then became cloudy, and threatening rain, and close and muggy at night. The temperature by day now fell to 88 or 90 deg., while that of the night was 86 deg., and most oppressive. The dew point, also, rose to 82 or 83 deg., shewing the enormous quantity of aqueous vapour in the air, such as precedes rainy seasons in the tropics;" but probably existing here from a delay in the fall of rain and previous extreme heat in a more than ordinary degree. "This state of the weather was remarkable from the 5th to the 21st June, when a heavy thunder storm and fall of rain caused an improvement

for a day or two ; after which the weather again became, and continued, as bad as before till the 28th, when a heavy gale, with much rain, came on, and continued for several days, the dew point and the thermometer fell, and the disease ceased."

"On the 11th of June, the first case of cholera took place in the 86th regiment ; on the 12th, two other cases ; and on the 13th, another : of these four, two died. On the 14th—a close, calm, oppressive day—two cases were admitted in the morning ; and after the men had dined, and during the afternoon, cases of cholera, of the very worst description, began to come into the hospital at the rate of three or four each hour, and by next morning, from fifty to sixty cases had been admitted. The disease continued to spread with appalling rapidity, intensity, and fatality ; so that, by the morning of the 18th, there were 313 admissions, and 174 deaths ! By the 22nd, sixty-eight more cases occurred ; and to the 30th, inclusive, eighteen other cases ; making in all 399 admissions within sixteen days, of which number 235 died."

It is here worthy of remark, that there were no less than 381 cases of the disease during the first eight days—that is, between the oppressive day of the 14th and 21st—when a thunder storm occurred ; and only eighteen cases between this and the period when the visitation of the disease terminated ; which cessation succeeded, also, to a storm, and setting in of the monsoon—or periodical rains, and which, in ordinary seasons, commence about the middle of the month, at which time the disease, in absence of the rain, occurred ; the wind, at this period, coming from the monsoon quarter ; the weather, during the time, being calm and exceedingly oppressive, evincing, by the high range of the dew point which existed, the extreme humidity and altered electrical condition of the atmosphere.

"Although cholera appeared, with great violence, in the 60th Rifles, and 1st Bombay European Fusileers, at this station, yet in the unfortunate 86th there were *three times* as many cases as in the 60th, and rather more than twice as many as in the Fusileers ; but the proportion of fatal cases to admissions was nearly the same in all three regiments. The first outbreak was in the 86th, which had 100 cases in hospital before the disease had decidedly set in with the two other corps. The first cases were almost universally fatal, the virulence of the disease *having been* most concentrated on its first appearance, and becoming *more controllable*, and less general, as its progress continued."

Or, would it not be more correct to say, that its severity was in proportion to the susceptibility of the individual, and that the first seizures were, therefore, destructive as the patients had less resisting power? And hence the facts subsequently recorded, that the first description of cases were characterized by immediate collapse, death occurring in some cases in an hour or two; while, on the contrary, in the last description of cases which occurred, the conservative powers of the system being stronger, the attack not unfrequently terminated in fever, as it generally did, during its epidemic visitation in this country, where the constitutional powers of the individual, from difference of climate, were proportionately stronger.

“Of the 1st 100 admissions, 79 died, 21 recovered.

„ 2nd 100	„	66	„	34	„
„ 3rd 100	„	50	„	50	„
„ 4th 100	„	40	„	60	„

“On the 14th, 15th, and 16th, particularly the 14th and 15th, the cases were generally brought in in a state of collapse, and death followed in three or four hours; indeed, in some instances, in one hour. But the peculiarity, in many cases, was neither vomiting nor purging, or only vomiting or purging; and, in the latter cases, by no means profuse. Another peculiarity was, that, among some of the first cases, before the natural hue had been replaced by that livid look so characteristic of the disease, the pulse at the wrist was almost imperceptible, the eyes turned up, and the voice hollow and feeble; in an hour after, such cases were dead. I should add, that these cases suffered from severe cramp of the lower extremities, seldom extending to the abdomen.

“The next class of cases were those where the attack was equally sudden, and the collapse preceded the vomiting and purging of serous fluid; or appeared sinking with prostration of strength and restlessness, accompanied by vertigo, deafness, loss of sight in many cases, hollowness of voice, weak and slow respiration, nausea, and vomiting and purging of serous fluid, intense thirst, and sensation of burning heat in the course of the colon. The circulation seemed as if suddenly impeded, especially in the extreme vessels and capillaries, and collapse quickly followed; the features became shrunk, and the lips and skin assumed a ghastly livid hue, which often pervaded the whole body; the pulse weak or imperceptible at the wrist; the skin became rapidly cold and clammy, and covered with copious perspiration. The sy

modic symptoms were generally most remarkable in the first stages, assailing the muscles of the lower extremities, and very often the abdomen, also, and, in fact, the whole body. Although these symptoms were those generally met with, they were not universal, and it was rare to find them all in one individual. *The purely pathognomic symptoms of the disease were, loss of nervous power, weakened circulation, tending, in a greater or lesser degree, to collapse, and cold perspiration, to such an extent that the clothes and bed of the patient seemed wringing wet.* In a third class, the patient was suddenly seized with vomiting and purging of matter like rice water, cramps of the legs, arms, and belly, rapidly inducing prostration of strength and early collapse, often within an hour or two of the first attack. Lastly, there was a number of cases in which there were evident signs of reaction, or an attempt of Nature to bring it about, but, in many instances, the brief effort was too much for the system, and it rapidly sank; but, in general, this class was more manageable than the others, and not unfrequently terminated in fever.

“The four types of the disease just alluded to, occurred in the order of succession in which they are placed! each predominating in the four groups of cases, which are arranged, to show the gradual modification of the disease by time. In three-fourths of the cases, the attacks were sudden, often within a few minutes; in the other, there were occasional slight symptoms for a few hours, or even a day beforehand. There was often an absence of purging, vomiting, and cramp, but in no case did the skin fail to pour out fluid in large quantity; this might have been called the chief symptom. The mind was usually clear and collected, unless when disturbed by the torture arising from severe and protracted spasms; and in a few cases it was observed to wander, as coma, which usually closed the scene, set in.”

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### Remarks on the Epidemic Cause of Cholera.

Without offering a decided opinion upon a subject open to so much controversy, I may observe, that the epidemic cause of the disease, whatever it may be, must operate upon the body either extrinsically or internally. Cold may be thought an external cause, arresting the function of the skin or lungs, more particularly exposed to its influence, and no doubt is an accessory agent in many cases; or, extreme humidity of

atmosphere may be such a cause, (and probably was so at Kurratchee), arresting the vaporous exhalation from the system, and with it the carbonic acid of the blood ; and thus by retention of the latter, poisoning the vital stream, and, by the retention of the former, producing congestive fulness of the vessels. A thunder-storm may also be considered such a cause, as evinced by its capability of addling or destroying the vital qualification of eggs ; or arresting the process of fermentation, and souring beer, exposed in a bad cellar to its influence ; or, as it is said sometimes to do, to kill the fish in a pond—effects which are known to succeed to a thunder storm of even half an hour's duration. Now, as the vitality of fish is dependent upon certain chemical changes which are going on in the body of the animal, which are common to the rest of the animal creation, and the incubation of the egg is dependent upon changes of a like character, and the fermentation of beer also dependent upon the same, and which, in either case, are effected by the agency of the oxygen of the air, in its combination with the carbon of the blood of the animal, or that of the white of the egg, or of the carbon of the sugar of the beer—we are naturally led to infer, seeing the same chemical process is going on in man's system, and upon which his life is dependent, that this process may be arrested or impaired by the same cause, or some analagously suddenly altered electrical condition of the atmosphere—and the disease, as a consequence, be induced, in persons predisposed by previous derangements of health, or subjected to a greater amount of exposure to the influencing cause, or possessing a greater susceptibility of system to be affected by it. We see this analogically illustrated in the beer, and eggs, and fish, which are proportionately affected by circumstances of exposure, or cause of like character. As this chemical process, upon which life is dependent, is effected in the system through the agency of the lungs, or function of the skin, in the absorption of oxygen into the blood, and exhalation of carbonic acid, the operating cause, whatever it may be, we may fairly presume to act, primarily upon, or through the function of one or both of these organs, in arresting or impairing this process through their agency ; and that such an influence thus operating upon the skin is capable of producing such an effect, the recent experiments of Messrs. Beckquerrel and Brequet, of Paris, most unequivocally demonstrate. These gentlemen plastering a rabbit's skin all over with an impenetrable composition of wax, and thus cutting off the influence



of the atmosphere upon the surface, and arresting the skin's function in the absorption of oxygen and exhalation of carbonic acid, the animal immediately lost its heat and died in a couple of hours. Now, taking this fact in connexion with the ordinary one of the frequency of diarrhoea from the influence of cold on the skin, in getting damp feet and the like, the causes assigned, or any other operating in like manner in impairing these pre-eminently important functions, or indirectly producing the same effects upon the system, offers a very reasonable and probable solution of the question as to the cause of cholera. In short, the cause must thus operate extrinsically, or otherwise internally, as malaria, or other of the noxious gases when respired, are found to operate as poisons. There are no other reasonable modes in which, to my apprehension, the epidemic cause can act; and as any one of the causes assigned in certain conditions of the system is, in my opinion, equal to the production of the disease, or one of like character; one of such causes in some cases, or any combination of them in other cases, may be very well accepted as the probable cause of the disease in common, and as a reason why, it may be justly apprehended, as an epidemic also, to be of no unfrequent occurrence.

The epidemic cause of the disease at Kurratchee may be thus explained;—it occurred in June last, just before the setting in of the periodical rains, after an unusually hot and dry season, a few days after the wind had shifted to the monsoon quarter, when the temperature fell, and the dew-point suddenly rose to within a few degrees of the mean temperature of the air in the shade, evincing its extremely humid state, to within, indeed, three degrees of its absolute saturation with moisture. To this condition of humidity of the air as an exciting cause, may the disease be fairly attributed; and that it was so in reality, to my apprehension, is as clear as the noon-day's sun;—seeing that the disease was not only arrested, and suddenly so, by a storm with a fall of rain, but ceased altogether immediately on the setting in of the rains and fall of the dew-point; or in other words, condensation of the vapour, and restoration of the air to its normal and healthy condition of freedom from undue humidity. A few facts, which I shall adduce in illustration will, perhaps, render this still more conclusive:—first, in proportion to the quantity of aqueous vapour in the air, would the latter be deficient in oxygen. Dr. Wells having shown that air, at the temperature of 100 degrees, saturated with moisture, contains one-

twentieth part of its volume of vapour ! Secondly, as a humid state of the atmosphere is invariably attended with a low barometer, there is not the usual support or incumbent sustaining pressure of the air on the surface of the body, and in consequence, the blood is not returned by the veins so freely to the heart as usual ; nor is there so much oxygen imbibed into the system. From both these causes, united with another equally important, the default of evaporation and exhalation of fluids from the system, (and the poisonous one also of carbonic acid from the blood), would congestive repletion of the vessels ensue ; and, as Majendie proved, that absorption from without takes place in the inverse proportion to the distention of the vessels, so would the absorption of oxygen from this cause also be as proportionately diminished ; and thus the sense of debility and perspiration which so readily ensue on exertion in a humid state of the weather, and the fact, as every stage coachman can testify, that a horse in this condition of the atmosphere so soon sweats, and is incapable of half its ordinary duty. And, lastly, in proportion to the humidity, is the conducting power of the air in relation to electricity,—and thus, too, would the body be robbed of its electrical or nervous power as fast, or nearly so, as it is generated in the system. I could mention other baneful operations of extreme humidity of the atmosphere, but these alone are a combination which could not fail of producing a very sensible effect upon every living being ; and hence the fact that, during the epidemic visitation of the disease, animals have not unfrequently been affected also—and that persons who have escaped the disease during its epidemic prevalence, have very generally complained of experiencing a sense of malaise, with depression of power and dyspeptic symptoms, characterizing a generally prevailing morbid influence during the same period : and hence, too, the fact recorded by me in 1831, as the fruit of my experience in Warsaw, “that a rainy, or rather humid, state of the atmosphere is that in which I found the severest form of the disease most frequently to prevail, and in which I have also found, in the treatment of the disease, remedies by far the least successful—adding, that a stove, or fire, or red-hot bricks, or other means of drying the air of the apartment of the sick, I should strongly advise on such occasions ; as well as the more free use of stimulants internally, when no objection exists to their administration.”

In conclusion, I have only to add, that I have said this much in

illustration of what I believe to be one of the more frequent causes of its epidemic prevalence; but there are others of a more occult character, giving occasion to the disease in common, and although less conspicuous, operating, I believe, much in the same way, or virtually so in all cases—that is, to the effect of arresting or retarding those chemical changes which take place in the blood, and on which life, or its attributes—heat and motion, are dependent!—an effect, however induced, which I believe to be, the essential cause of the disease in all cases.

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### ***Cholera not Contagious—Facts in Illustration.***

Upon the question whether cholera is infectious or not, I can speak decidedly that it is not so! This is no vague opinion, hastily arrived at, but the deliberate result of grave consideration and lengthened observation. Without entering into a protracted discussion upon a subject which, in the sequel, would prove unsatisfactory to those who have already made up their minds to the opposite conclusion, I shall briefly adduce a few facts corroborative of the opinion expressed. First, observing that, when in Poland, the principal cholera hospital of Warsaw, of which I was in charge, was on the skirts of the city, and the rendezvous of all the incurables within it, the professionals of the city sending me all their hopeless cases, and I had from thirty to sixty cases constantly under treatment, of which number half a dozen or more were buried daily. Well, then, of thirty or more attendants, during the three months that I was in charge, we had, among this number, only two cases of the disease; and the cause of the attack in both cases was most satisfactorily to be explained. One of these men was not employed in attendance upon the sick, but in the kitchen, preparing the food, and daily frequenting the shambles; the other, an hospital attendant, whom the apothecary, finding intoxicated, had locked up for the night in a damp cellar, with no other covering than his shirt. Now, as the epidemic condition of the air was at this time in existence, a sufficient cause of the disease in both these cases is apparent, without the remotest necessity for attributing either of them to infection. Whereas, the hospital attendants, who, in turns, were confined night and day by their duties on the sick and dying, sleeping on the floor by night, or on any of the unoccupied cots, and in the focus of forty or

more cases upon an average in various stages of the disease; and who were further employed by day in assisting at the dissection, and sewing up the bodies of such as were examined, which were numerous, cleaning, also, the dissecting-room, and burying the dead,—wholly escaped the disease; as well as myself, who was daily occupied among them, and often till eleven o'clock at night. And more than this, the French government, having sent a commission of medical gentlemen to Warsaw, I gave them the opportunity, afforded by my hospital, to try any experiment they thought proper with reference to this question, and they not only dissected a great many bodies, but tried various experiments, not only upon animals, but upon themselves also, by inhaling the breath, and inoculation with the blood and excretions of the sick, and in no way was it possible to produce the disease, or infect another person! To these facts I may add another, namely, of a gentleman with the disease dying upon my own cot, and my having not only slept, on the following night, in the same room, but upon the cot and bedding as well; nor were any of my personal establishment ever affected by the disease; nor were any of the professional men of Warsaw to my knowledge affected, save two, and one of these was a gentleman not in practice, but who, feeling unwell, had endeavoured to right himself by keeping his bowels open by eating sour half-fermented rye bread!

To these facts I may add those of daily occurrence in India, the disease attacking exclusively the men occupying the lower floor of a barrack, while those of the upper floor escaped; of its attacking the men sleeping on one side of a ship's deck, in the roads off Madras only, or one portion of a cantonment, or the inhabitants of one bank of a river exclusively; or of the disease attacking a regiment on its march most virulently to day, and ceasing on the regiment's moving a few miles on the morrow. And I may next refer my reader to the circumstances attending the occurrence of the disease at Kurratchee, as previously recorded; and in proof, also, of another fact, namely, its occurrence in certain conditions of the atmosphere, and with the greatest virulence at the outset (in opposition to the ordinary mode of the extension of contagious disease), and diminishing immediately after a storm, and suddenly terminating with a permanent change in the weather.

There is another fact which alone, in my opinion, is sufficient to decide the question, namely, that contagious diseases are one and all of

them characterized by the fact, that the poison, or infectious matter of the disease is concocted or developed in the system under circumstances of quickened circulation of the blood and depraved secretions—under a heated and excited state of the system—under the conditions, in short, of fever; whereas the condition of the system in cholera, and characteristic features of the disease, are precisely of the opposite character—inertia, general prostration, cold, defective excitement! It is true that fever, or a certain degree of excitement, very generally succeeds to the attack, but if this disease be properly treated, the fever is, in general, slight, and of short duration; indeed, a simple reaction, as the conservative energies of the system recover themselves. This fact, in my opinion, deserves particular notice, as it occurs in a disease which often takes its rise from a cause—malaria, which, under ordinary circumstances, gives rise to fever of a remittent character, and often, therefore, of lengthened duration; leading to the inference, which I have long since arrived at, from a different train of reasoning, conjoined with observation and successful treatment, that the evacuations which attend cholera are curative efforts of the system, eliminating the malarial impregnation of the blood, and expelling from the system this poisonous agent, and thus the fever which succeeds it, is of slight degree and of short duration—that is, when, as I have before said, the disease has been properly treated.

With these facts before him, can any man, exercising common sense, come to any other conclusion than the one I have arrived at, namely, that the disease is not infectious, but that the predisposing cause of it, in some cases, or the exciting cause of it in others, is aerial, and this often, too, of local origin? or, when not so, this aerial cause is aided in its effects by local agencies and predisposing conditions of the system favourable to the development of the disease?

Persons, it is true, are not unfrequently attacked by the disease occupying the same house, in like manner as they are attacked with typhus fever, scarlatina, or the like, and for this very obvious reason, that they are exposed to the same aerial currents or local influences, and circumstances, in numerous other particulars, which occasioned the disease of the individual first attacked.

After saying all that I have done in proof that the disease is not infectious, I cannot, however, too strongly urge upon all the necessity of free ventilation, and the utmost cleanliness being observed, not only

about the persons of the sick, but with respect to those in health also, and the dwelling of every one, both in the house and around the locality, wherever it may be situated; and when the disease prevails, the closing of windows, and exclusion of the air from the direction in which the disease is known more particularly to prevail, or of any obvious cause of the pollution of the air, such as dung-heaps, sewers, burial grounds, ponds, marshes, or the like; the cause, if not in all cases being thus derived, assuredly being very frequently so, or aggravated by them. And thus we see that one house, or side of a street, or locality becomes infected with the disease, and not another; and thus, too, it is, that low, crowded, filthy, and ill-ventilated situations are those in which it more frequently prevails. And in illustration of the effects of such causes, I may mention an occurrence at Clapham, a few years ago, when the contents of a cess-pool having been thrown over a garden adjacent to the play-ground at a boys' school, of 22 boys, 20 were attacked with vomiting, purging, and symptoms precisely in character with those of cholera, and of which number two died within the period of a couple of days!

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**Case of Cholera, illustrating the nature of the attack as it frequently occurs, and the application of the remedies—  
Calomel and Blood-letting, in its treatment.**

A gentleman of plethoric habit, 30 years of age, at mid-night on the 1st of June, 1828, sent for me, having been attacked with vomiting. He had had several watery evacuations during the day, and a copious one half an hour before the vomiting. He felt during the day unusually languid, with a sense of fulness in the bowels; but he thought nothing of these symptoms further, than that he required a little medicine. His pulse was 84 and pretty firm, skin warm, his breathing was free, and he was perfectly exempt from pain of any kind. As his stomach felt sick, and he expressed that he thought his dinner might have disagreed with him, I made him drink freely of warm water, and in this way relieved the stomach, supposing it an attack simply of indigestion. Ten grains of calomel with two spoonsful of brandy and water were now given, and a mixture of Epsom salts and magnesia was directed to be taken every two hours afterwards.

On the 2nd, at 6 a.m., I found he had vomited twice since I left him, and had had two or three scanty watery evacuations ; his skin was comfortably warm, and his pulse good. A mixture of salts and senna, with ammonia, was now directed to be taken instead of the former, with a pill of four grains of calomel, alternately one and the other, every two hours. At 10, when I visited him again, I was astonished at the altered appearance of his countenance, which was now of a dusky hue, his eyes appeared sunken, and his lips were livid ; he had a constant feeling of numbness in his hands, as well as in his legs and feet, and had a little cramp in the thigh. He rejected the first dose of the mixture, but had retained the second ; I found, too, that he had passed several watery evacuations, which, upon examining, at once confirmed what his countenance now betrayed, the real nature of his complaint—their appearance being simply water, in which a few mucous shreads were floating. His pulse still continued 84, but had materially decreased in strength, and his skin was of reduced temperature ; looking upon it now as cholera, 24 grains of calomel were placed upon the tongue, and washed into the stomach with two table spoonsful of brandy and water ; keeping him in the recumbent posture, he was now bled ; after the loss of about a pint of blood, as he felt faint, I placed my finger over the orifice in the vein, and after giving him a little more brandy and water, allowed another half-pint of blood to flow, which materially reduced his pulse in strength. Shortly after this, on taking a little brandy and water, he brought up a mouthful of muculent fluid with some of the calomel ; presently after, another 24 grains of calomel were given, and a warm salt-water clyster was administered, the latter being repeated every hour afterwards ; his pulse still feeling subdued by the bleeding and his skin a little damp, I gave him 30 drops of spirit of sal volatile in two spoonsful of water, and repeated this every ten or fifteen minutes, till the pulse improved. At 12 o'clock he felt a little heaviness over the head generally, I suggested the application of some leeches, but as he urged there was no pain, I did not press their application ; 12 grains of calomel were now repeated. At 1 p.m., his pulse had much improved in feeling and strength, but he still appeared to labour under a good deal of oppression—sighing deeply, and moaning occasionally, though quite free from pain, complaining that he wanted air, and that they did not fan him sufficiently, although two men were thus constantly employed ; he now took 8 grains of calomel. At 3, as he expressed a

desire for cold water, and his pulse was pretty good, and his skin of moderate temperature, I allowed him an occasional wine-glassful. At 6, he was much in the same state and took three pills, composed of four grains of calomel with an equal quantity of antimonial powder and extract of colocynth, these pills happening to be at hand. At 8, as he appeared to have made no progress since 3, I determined upon the cautious abstraction of more blood, and the continued use of the calomel, till bilious evacuations were induced; 20 grains of calomel being first administered with a little brandy and water, I re-opened the vein, and allowed the blood to flow gradually, till the pulse was affected by the loss; 10 ounces being thus taken, and the pulse being a little subdued, 20 drops of spirit of ammonia were given, and repeated occasionally. An hour after, as the pulse had returned to the same state as it was before the bleeding, I cautiously withdrew 8 ounces more blood. At 10 p.m., the pills of calomel and colocynth were repeated, and the clysters, which had been continued till now, were omitted. At 12, 20 grains more calomel were given. At 2 a.m., as he appeared to have made no advance, and as the pulse justified the practice, I bled him again to 10 ounces. At 4, the pulse had decidedly improved, and he appeared in every respect better, but as the evacuations continued of the same aqueous colourless character, 10 grains of calomel were now repeated, and the same dose at 6, when I left him much better in every respect; his pulse was 96, and of good strength, and as he desired it a little chicken broth was allowed.

On the 3rd, at 8 a.m., the calomel was repeated. At 10, the chicken broth having been again taken, had induced oppression of the stomach, a little sickness and general feeling of derangement. At 12, quite recovered from the feelings of oppression, having taken an hour ago, 10 grains more of calomel, and has since passed for the first time a small green muculent evacuation, and a little urine—his evacuations till now appearing to consist simply of water with a few mucous flakes interspersed, the latter however having much increased in quantity since morning. Up to this period he took nothing but water, with the exception of the broth before-mentioned, and occasionally a little brandy and water, when he felt, as he sometimes did, a sense of weakness come over him, at which time his countenance would become dark and lips livid. At 4 p.m. I found that he had several dark green spinach-like evacuations since my former visit, and had passed urine freely; the



calomel was repeated. At 8, he was better in every respect; he had had three or four evacuations, like the former, and had slept for three quarters of an hour at a time. Ten grains of calomel were now repeated, and the same dose directed to be taken at day-light.

On the 4th, at 6, a. m., I found he had had a tolerable night, sleeping at intervals, and that he had many scanty, dark, bilious evacuations; his urine was abundant, his pulse 84, moderately strong and full, his skin of natural temperature, and feelings comfortable. Four grains of calomel, with two grains of aloes, in soft pills, were ordered to be taken every three hours. Sufficient now to say, as the disease was cured, that he continued the calomel, in combination with an aperient, till the evacuations were of yellow appearance; his gums becoming tender, and a little salivation being induced by the mercury. A small quantity of quinine was administered after this, and his convalescence was rapid, so much so, that, on the 12th, although he had taken no less than 280 grains of calomel, and had lost, at four operations, 56 ounces of blood! He told me, in despite of the soreness of his gums, that his appetite was so good, that he could scarcely refrain from eating the whole of the roast fowl, of which he dined the day before; and that he slept well, and, indeed, felt in every respect well, save some degree of weakness, which I may here, in conclusion, say, he rapidly got the better of, and enjoyed good health afterwards.

This case was recorded at a time when my views of the disease and of the indications of treatment were not so perfect as I believe them now to be, but is here adduced as being, in my opinion, replete with instruction, exhibiting, in a more than ordinary degree, the necessity of a steady and patient perseverance in appropriate remedies, guided by well-defined principles of treatment.

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### *Case Second.*

A strong-built man, of about 35 years of age, was, on the 26th of July, admitted into the hospital at Warsaw, at 11 a. m. Skin universally cold, and extremities livid, pulse scarcely perceptible, tongue and breath cold, countenance death-like; evacuations have ceased. A scruple of calomel ordered every two hours, and occasionally a small quantity of weak warm spirit and water. Friction with the mercurial embrocation

for half an hour, made in the proportion of a scruple of the bichloride of mercury with a drachm of the chlorate of ammonia, and 4 ounces of water; having it well rubbed into the skin of the thighs, arms, and arm-pits, and on the chest, previously applying hot flannels to these parts, and rubbing them afterwards with the same to facilitate its absorption. A clyster of warm water, with a dessert spoonful of salt every half hour; and two hours hence apply thirty leeches to the pit of the stomach.—27th. Very little amendment. Repeat the calomel, the mercurial friction, and clysters as yesterday.—28th. Very much better in every respect. Repeat six grains of calomel every two hours, and a clyster four times a day.—29th. Pulse 84, moderately full and firm, skin of natural temperature, tongue cleansing from a thick fur, gums tender, countenance animated, evacuations of a bilious appearance, and urines freely. Repeat calomel, six grains, and at noon let him take an ounce castor oil.—30th. Convalescent. Sulphate of quinine, two grains four times a day.—On the 2nd, he was discharged cured.

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### **A Domestic Remedy—Salt.**

On occasions of necessity, when calomel and the other remedies recommended in the treatment of cholera are not forthcoming, common culinary, or table salt, I believe to be the next best remedy. It was first employed by the natives of India, as pointed out and recommended by me, in November, 1830, to the Russian Government, as well as to the Director-General of the British army; and it was said to have been used with great success in the Russian army during the Polish campaign. It was, moreover, used by me, and many others also, in India, with considerable success. Its operation is two-fold, that of a stimulant and evacuant, and is much, therefore, to be preferred to brandy, and this class of remedies, which have been too commonly employed. A large teaspoonful (half an ounce) of salt, dissolved in half a pint of warm water, should be immediately swallowed, and the same dose repeated every ten minutes, till it operates effectually as an emetic. After which, the same quantity of salt being dissolved in as much cold water, should be given in doses of two tablepoonsful every half hour or so, assisting its operation on the bowels by a clyster every hour, of half-a-pint of the same solution of milk-warm temperature, and repeating both till

feverish heat and excitement become developed, or cold water is urgently desired by the patient, when they may be continued at longer intervals, and a wine-glassful of cold water given occasionally between the doses of the solution. But, as an accessory remedy to the salt, as excitement becomes developed by its use, I found bleeding to be very generally required. A grain of emetic tartar added to every half-pint of the solution, in my opinion, would add much to its utility.

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### **Mercurial Inhalation.**

In a paper I published in the *London Medical Gazette*, in 1831, I recommended also to trial the administration of mercury, through the medium of the lungs, by inhalation, describing the apparatus which might be employed for the purpose. Its recommendation was founded upon the fact previously noticed, that, in an advanced stage of the disease, the congestive condition of the vessels of the stomach and bowels prevents the absorption of the calomel, or other remedy, through these—the ordinary channels of their introduction into the system; and this, I repeat, is, in my opinion, one of the principal causes of the fatality of the disease. And if this be true, this mode of administering mercury,—of which calomel is but a preparation,—that is, by introducing it into the system through the medium of the lungs—a method which has been successfully employed in treating some other diseases, recommends itself to our adoption, with reasonable prospects of success. As the simplest mode of practising it, a tile, or brick, being made red hot, and put upon some sand in a dish, may be placed beneath the bed-clothes, and the patient, enclosing his head, may be allowed to breathe the vapour developed by throwing half a drachm of calomel, or red sulphuret of mercury, on the heated object; or it may be inhaled from the tube of a funnel inverted over the dish. This might be repeated every hour or two, till amendment takes place.

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### **Oxygen Gas.**

Another remedy I recommended, at an early period of the epidemic *invasion* of the disease in India, was the inhalation of oxygen, or the

nitrous-oxide gas, and have done so in this treatise also ; and should the disease again occur under my own observation, I shall do my best to carry it efficiently into practice. And I here call upon the profession in general to do the same, as well as to give trial to the mercurial inhalation in cases of necessity, as the indications for these remedies must be conspicuous to every one. It is to the trouble which attends their adoption, and to the difficulty of obtaining the gases more particularly, that their non-employment may be attributed ; but these surely are not sufficient reasons to justify our withholding from use remedies so strongly indicated, and possessing, withal, such pre-eminently powerful and useful qualifications, and harmless at the same time, in a disease which has so often baffled all ordinary treatment.

Oxygen gas is most readily procured by decomposing the chlorate of potass with an equal proportion of the oxide of manganese in a glass retort—say an ounce of each—by the heat of a spirit lamp ; and the nitrous oxide by the decomposition of the nitrate of ammonia, which may be readily made by saturating pure nitric acid with carbonate of ammonia, and evaporating the neutral compound to dryness, and then introducing two ounces of it into a glass retort, and effecting its decomposition by the heat of a spirit lamp, taking the precaution of collecting the gas produced through water, or allowing it to remain a short time over water, that the nitrous vapour may be deposited ; and these gases, either one or the other, may be inhaled pure or mixed with an equal proportion of atmospheric air, as largely and freely as possible.

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### ***Injecting Remedies into the Veins***

Is another measure which I was not only the first to suggest, but to carry into practice, long before it was practised in England ; but till the measures, suggested above, have been fairly tried and proved wanting, we should not be justified in recommending to adoption a practice which is open to so many objections.

### A List of Remedies,

Applicable to the treatment of cholera, dysentery, and fever, recommended to be provided by travellers in general, and by those in India residing at out-stations, where professional aid is not available :—

A Family supply, to be preserved in well-corked bottles.		Papers of ten grains each, for Individual use.	
Calomel .....	1 ounce	.....	No. ... 12
Emetic tartar .....	$\frac{1}{2}$ ounce	.....	„ .. 1
Dover's powder .....	$\frac{1}{2}$ ounce	.....	„ .. 3
Opium, in powder .....	1 drachm	.....	„ .. 1
Sulphate of quinine ....	1 ounce	.....	„ .. 8
Calcined magnesia .....	1 ounce	.....	„ .. $\frac{1}{2}$ ounce
Epsom salts.....	8 ounces	.....	„ .. 2 ounces
Laudanum .....	$\frac{1}{2}$ ounce	.....	„ .. $\frac{1}{2}$ ounce
Blistering plaster.....	1 ounce	.....	„ .. $\frac{1}{2}$ ounce
A small pair of scales, with grain weights.			

A vial containing two dozen of the pills of calomel and aloes, advised in the 37th page, as a remedy in ordinary.

A single traveller may provide himself with the few papers of the several articles named in the second column; and as each is known to contain ten grains, it will enable him to subdivide it, as needful, with sufficient accuracy without scales: attention must be paid that they are secured in a piece of oiled silk against damp. But a family travelling, or individual at an outpost, I should advise being provided with the supply first named, as the cost and package are but trifling, and then upon necessity, assistance may be afforded to servants and others. A few other articles may have been mentioned in the work, but as these are not indispensable, they have not been included in this list.

Pills may be made by mixing the ingredients with a particle of fruit jelly on the bottom of a plate with the point of a knife, adding a few grains of flour to give consistence if too soft, dividing the mass into equal sized portions, and rolling them between the fingers into the shape of pills.

THE WHY AND THE WHEREFORE;  
OR,  
THE PHILOSOPHY OF LIFE, HEALTH, AND  
DISEASE.

BY CHARLES SEARLE, M.D. M.R.C.S.E.,  
AND LATE OF THE B. I. C. MADRAS ESTABLISHMENT.

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"A cripple on the right road will sooner reach the distance-post than a racer on the wrong."  
SWIFT.

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**Analytical Digest of the above Work.**

In seizing upon a single fact, which I believe I was the first to arrive at, that the active principle of life is the result of chemical action, maintained in the system by the agency of the air we breathe and the food we receive into the stomach, I was led, as far back as 1830, to explain the whole phenomena of cholera, and arrive at deductions for its treatment, which all subsequent experience has proved to be correct in principle, and which the Medical Council of St. Petersburg did me the honour to designate as both "luminous and novel," and which, my present work on cholera, dysentery, and fever, in substance reiterates. The fact that I then arrived at, and have since pursued, has led me, however, to more important results—the explanation now afforded of all the phenomena of life, both in health and disease—and has furthermore directed me to this highly important result, viz. : that every disease consists, intrinsically or virtually, in some derangement of the primary action of life—in the derangement, that is to say, of the action of the organic capillary vessels, or those of nutrition, secretion, &c. ; these vessels constituting the principal substance of all the organs, and in which life is first manifested. All deranging causes operating either as sedative agents upon the system, inducing torpor of function and retarding the blood's motion through these vessels, by which congestive

accumulation takes place in the veins ; or, as irritants, directly or indirectly exciting increased action of these vessels, and the blood's quickened motion in the arteries, as in fever ; or, lastly, as in an extreme degree of irritation, or excitement of the capillary vessels, developing inflammation, by which blood is converted into pus or matter, or it otherwise operates to the destruction of the organization of the part. These, then—*congestion, irritation, or inflammation*—I arrive at the conclusion by deduction, and assume to be, the essence or attribute of every disease, some of the more highly malignant alone excepted, as cancer and some others, such being connected, I believe, with that amount of depravity, or other condition of blood, that operates to subvert or derange the before-mentioned ordinary, and more natural effects.

To enter a little more into detail, I proceed then in this work, first to show that, as every disease consists in some derangement of health, and that as health is but the normal or natural condition of life, a knowledge of life must be the foundation-stone of all just reasoning on disease ; and as the attributes of life consist in heat and motion, the maintenance of these in their integrity in the animal system, is the knowledge sought for. This is accordingly explained as the effects of the chemical action, developed by the agency of those essential requirements of existence, air and food, when received into the system ; and illustrated by the ordinary effects of combustion, which ensue, as exhibited in the candle, by consequence of the combination or chemical union of the oxygen of the surrounding air, with the hydrogen and carbon of the tallow or wax, under the excitement of the heat first applied, and afterwards present in the flame—heat and light, as constituents of oxygen gas, being liberated by condensation of the gas in the process : similar to which, in the animal system, the union of the oxygen inspired, in its combination with the hydrogen and carbon of the food, and existing in the system, in admixture, as constituents of the blood, develops or gives out caloric and electricity,—another form of light, a motive power, the nervous energy, in the process, and thus are *heat and motion, the attributes of life*, maintained in the system ! And that a motive power, the actuating principle of life, is thus developed, we have immediate evidence—in the action it imparts to the capillary vessels, or those in which these chemical changes take place, immediately situated between the arteries and the veins, and constituting

the vessels not only of nutrition and secretion, but primarily also of the blood's circulation. The first action of life, visible by the aid of the microscope, in the incubation of the egg, being the blood's circulation in these vessels (before any heart is to be seen), and the last to be discovered after the apparent death of an animal is, the circulation in these vessels also, and which continues for some hours after the heart has ceased to move. The action of these vessels, by which nutrition of the system is accomplished and the blood is circulated, (aided by the heart when this is formed) is excited by the electricity evolved from the blood they contain. The blood being the sole pabulum of life—it not only affords nutrition to all the system, but it is also the essential source of the warmth and vitality of all its parts. These nutritive and vital processes of the blood are effected in the organic capillary vessels—constituting, as I before said, the principal substance of all the organs and parts of the system. The heart's action and the blood's circulation, are subsidiary to these fundamental processes of life; all the purposes of the circulation being subordinate and essential to that of bringing the blood, enriched with the food which has been absorbed into it from the stomach, and the air it has imbibed from the lungs, to these vessels, that they may fulfil these nutritive and vitalizing processes of organic life. The powers by which the blood is circulated, consist of the heart, which, by its contraction, propels the blood from its cavity, through the vessels in connexion with it called arteries, and which again by its dilatation or expansion, draws the blood back into it through another set of vessels called veins. The blood is aided in its circulation and return to the heart, by the motion imparted to it by the action of the capillary vessels, or those, I repeat, intermediately situated between the arteries and the veins, and in which vital action first manifests itself. To the maintenance of this, constituting the organic life, all the actions of the system, and functions of the organs composing it, are essentially subservient, dependant upon, or conducive, this being the fountain of life, and the object in which all its phenomena terminate!

The functions of the several organs composing the body and subservient to life, are accordingly objects which next receive attention; first, those of digestion and assimilation, or such as are concerned in the reception into the system of the food and beverage and the conversion of these into blood; secondly, those of the blood's aëration, or vitalization, and of its distribution or circulation; thirdly, those of secretion



and the blood's purification : and this is followed by a description of the brain and nervous system, and all the varied phenomena which they exhibit are severally investigated, and the connexion existing between the mind and the body explained.

The maintenance of life and health, by the operation and agency of air, food, beverage, warmth, sleep, and exercise is then investigated ; and lastly, these several agents and influences on the system and mental emotions, in the production of disease, are explained.

After thus investigating the phenomena of life and health, and establishing the fact, that health consists in, or is essentially connected with, the integrity of action of the capillary vessels, or life as it first manifests itself in the organic structure,—we perceive, or deduce the fact, that all disease or derangements of health consist, intrinsically or virtually, in the disorder or derangement of this, the primary organic action,—that is to say, that of the capillary vessels and the functions they fulfil ; and as we next show that the disorder, or derangement of these vessels, consists in a condition of *congestion*, or passive fulness ; or of *irritation*, or preternatural excitement ; or of *inflammation*, or extreme excitement ; we determine and assume that one or other of these conditions of the capillary or organic vessels, is the primordial condition or essence of every disease—that all disease is therefore, intrinsically and essentially, of the vascular system—that one or other of the conditions above-mentioned, and which run into each other by insensible gradations, constitutes the disease, virtually wherever it may be located ; and that all the various forms in which disease manifests itself are, but in the localization of this the essential disease, modified in character by the nature of the structure and function of the part in which it is centralized, and the combinations resulting from the derangements which successively ensue.

Now, should this be true, (and the sequel, in the explanation afforded of the phenomena of all the principal diseases of the body, I am of opinion, most irrefragably proves it to be), the treatment of every disease is of necessity brought within the confines of a few general principles, definite in kind, although doubtless modified in degree by the constitution of the individual, his age, and the particular circumstances of the case ; and in thus simplifying the subject we take a step—a mighty step in advance of the present complicated system of medicine—a step assuredly of the utmost importance !

If the treatment of all disease may be thus embraced in a few leading principles, our remedies are necessarily reduced proportionably in number also ; and as the principal and most important remedies in the treatment of these affections of the capillaries appear to consist in calomel and blood-letting, I have next treated of these remedies, explaining the indications they fulfil, their operation, and the influence they possess, and the cautions necessary in having recourse to them.

It was Sir Astley Cooper, if I remember right, who said, as the fruit of his experience, that with the lancet, calomel, antimony, and opium, in their various forms and combinations, he could cure every disease. Now accepting this assertion in the spirit in which it was uttered, there can be little doubt of its correctness ; and if it be true, which I believe it to be, it affords a powerful argument in favour of the theory I have enunciated—namely, that all diseases consist virtually in the derangement of the vascular system, for these are their appropriate remedies, as the numerous affections, and the treatment I have detailed, clearly establish.

I have next treated upon those two all-prevailing affections—dyspepsia and nervous derangement—explaining their true characters, and exhibiting by what very simple means they may, in general, be cured ; that it is not to be accomplished by swallowing physic, but by fulfilling the laws of our condition—the constitutional requirements of our nature.

This is followed by an extension of the subject of disease, and an explanation of the phenomena and symptoms of the numerous affections of the brain and nervous system, (apoplexy and insanity being largely treated of) together with some notice of the influence of moral causes and mental emotion in inducing disease of the heart, and in developing a multitude of other affections. This is succeeded by two chapters on the numerous disorders and diseases of the stomach, liver, and kidneys, in which the causes of the extreme frequency of torpor and derangements of the function of the liver are, I believe, successfully explained ; and the development of cholera, gout, rheumatism, piles, and diseases of the bladder in the male, and of the womb in the female, are treated of in a simple way. And on the subject of the liver, I may add, the circulation of the blood through that organ is, I believe, satisfactorily explained, by exhibiting reasons for believing that the stomach and bowels are a respiratory surface, and that the blood here becomes re-vitalized, whereby its subsequent circulation through the liver is effected.

The diseases of the lungs, air-passages, and circulating system are next considered ; the numerous affections developed in those organs by cold, as cough, sore-throat, inflammation of the lungs, pleurisy, and asthma, are severally explained. The subject of phthisis, or pulmonary consumption, next engages attention, and a reasonable explanation of its causes and varied phenomena is afforded, evincing that it is a disease not primarily of the lungs but of the general system, and possibly secondary to defect of the cutaneous function.

The subject of fever is next treated of, and an explanation of its phenomena, in all its various forms and complications, is supplied. It was in treating of this subject that I first educed the fact, or arrived at the conclusion that all disease consists, as I have represented, in derangement of the organic capillary system. My explanation of the phenomena and character of the various diseases treated of, I did not indite to suit this theory, but the latter arose out of what I had previously written of them, which leads me to hope that, with facts for its foundation, the superstructure will prove equally solid !

Reverting to the subject of this Analysis : having treated of the various forms of fever and of its complications, and having explained the principles which should be pursued in their treatment, I have concluded the work by adding, by way of Supplement, some general rules, founded on the principles unfolded in the body of the work, and I have endeavoured to establish, for the preservation of health and the renovation and strengthening of the system, in which the true principles of hydropathy have been explained, and its practice, to a certain extent, approved of. The renovating influence of small bleedings is also enjoined, and I trust at the same time perspicuously displayed.

And thus ends a work, which the Editor of the *Medical Times* does me the honour to say—is “ as interesting as it is instructive ; upon the whole excellent—its excellencies such that any man might be proud of ; and a work which no common man could have written.”





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